THE MYRIAPODA IN THE AUSTRALIAN MUSEUM.

Part ii.—DIPLOPODA.*

By H. W. BRÖLEMANN, Pau.

(Plates xiv-xviii., and Figs. 14-37.)

CHILOGNATHA, Latreille, 1802.

OPISTHANDRIA, Verhoeff, 1894.

Genus Cyliosoma, *Pocock*, 1895.

(Pocock, 1895, Ann. Mag. Nat. Hist. (6), xvi., p. 414.)

This genus was created by R. I. Pocock with the New Zealand *Sphaerotherium angulatum*, Butler, 1878, as type species.

From his above mentioned work the following particulars may be gathered :—

1. "Male copulatory organs :—The movable digit of both pairs of copulatory forceps are composed of a single segment.

2. "Female vulva as in *Zephronia*" (*i.e.*: 'composed of two pieces, a proximal hairy piece bearing the aperture, and a distal usually polished piece'), but the proximal plate divided into two distinct pieces, whereof the external partially overlaps the internal.

3. "Tarsi as in *Zephronia*" (i.e.: 'distally narrowed, claw terminal, the upper spine close to but behind the claw.'")

The characters numbered one and two rank, of course, amongst the very best. As to the structure of the tarsi, it is not possible so far to allow it the same importance as the position of the dorsal spine seems to vary and the distance between it and the claw is a question of more or less.

Yet the matter is far from being exhausted with these rough notes; further, valuable particulars may be obtained by comparing the head of *Cyliosoma* with that of *Sphaeropaeus*. In failure of material, the excellent drawings published by vom Rath[1] and by Verhoeff[2] will answer the purpose, and the reader will kindly refer to same to fully appreciated the following differences :—

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* For Part i. see these "Records," ix., 1.

[1] vom Rath—Beiträge zur Kenntnis der Chilognathen, Bonn, 1886, figs. 13, 14, 27, 32.

[2] Verhoeff—Die Diplopoden Deutschlands, Leipzig, 2/3 Liefer., 1911/12, figs. 142, 178.

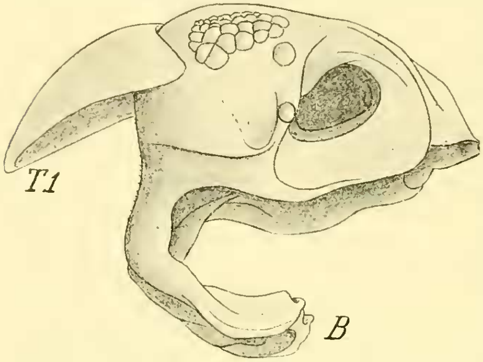

Fig. 14.—*Cyliosoma queenslandiæ.*—Skeleton of the head (antennæ and mouth parts removed), in profile, showing the "gulo-occipital bridge" *(B)* and the position of the first tergite *(Ti).*

Measured on the level of the eyes, the head is still broader than in *Sphæropœus* though almost as short. The upper lip is less produced. The antennal fossa, instead of extending backwards and being closed in front as shown by Verhoeff (*l.c.*, Pl. ix., fig. 142), is open frontwards and downwards and closed backwards by a strong, perpendicular, rounded ridge on which stand the isolated ocelli (fig. 14). The lateral surface behind the ridge is feebly depressed. The back part of the head is completely and evenly rounded, smooth and densely clothed with short hairs. A deep sulcus is to be seen laterally similar to that illustrated by Verhoeff, accompanied by a more or less distinct horizontal ridge beginning at a point near and below the inferior ocellus and dying out before reaching the posterior surface of the head. The processes which start from the posterior margin of the head are well developed and are fused with the hypostoma into a bridge (Verhoeff's "*pons gulo-occipitalis*"). But the distal part of the bridge, equivalent to the hypostoma, instead of being in a line with the processes, is placed nearly at right angle so as to be almost horizontal.

Epipharynx and hypopharynx very much resemble the same organs of *Sphæropœus.* The same might be said of the mandible except that the pectinate lamellæ are represented by only five rows of minute rods or spines, the two inner rows being composed of smaller and less numerous elements than the three outer rows. For instance, it is possible to distinguish fourteen rods in the first (outer) row, fourteen in the second, ten in the third and six in each of the fourth and fifth row, and besides some (five) pale warts which have probably to be considered as rudimentary rods. The tracheal stalk of the mandibula is considerably expanded, lamellar at its distal end; the proximal end is fused with the basal ring of the mandibula.

The gnathochilarium, compared with that of *Sphæropœus* as represented by vom Rath, is shorter; the proximal part (lamellocardines) is broader as the outer margins are almost parallel and do not converge backwards. The mentum is distinctly divided into two sclerites.

The above mentioned features are not all of equal value, but some of them, such as, namely, the structure of the head, are undeniably of first rate importance and are well suited to characterize a distinct family.

The limits of this new group cannot at present be better delineated, as very little is known of these interesting forms. However, it could be ascertained that *Sphærotherium libidinosum* Sauss. and Zehnt., from Madagascar[3] the type of which is preserved at the Paris Museum, participate of the structure of *Cyliosoma* as far as the head, the gnathochilarium and the tracheal stalk of the mandibula are concerned. Therefore, it is likely that the Australian and the South African (including Madagascar) species will have to stand together in one family—Sphærotheriidæ—equivalent to the old (Brandt's) genus *Sphærotherium*, while the Indian forms of *Sphæropœus*, and probably of *Arthrosphæra* and of *Zephronia*, will have to be set apart in another family, equivalent to the old (Brandt's) genus *Sphæropœus*, for which the name Sphæropœidæ is proposed.

Turning to the genus *Cyliosoma*, the following details observed on both species hereafter described are well worth mentioning and may be characteristic for that genus.

Antennæ very short, not much longer than the first tergite; the sixth joint is nearly cylindrical, similar in both sexes; the last joint is tipped with four strong sensory cones. In *S. libidinosum*, the antennæ are elongate, nearly twice as long as the first tergite; the sixth joint is slightly swollen distally; the last joint shows many chitinized, contiguous cells closed with a membrane, in the middle of which stand a tiny comb.

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[3] Whether *S. libidinosum*, S. and Z., is a good representative of the genus *Sphærotherium* is not known.

The male seminal duct opens in the posterior surface of the second pair of coxæ, into which a large round aperture is cut open. The aperture is filled with a bead-like organ which is the distal end of the seminal duct. When not entirely contracted, it shows, near it's top margin, a transverse opening sunk between two membranaceous, lip-shaped pads. The rest of the organ is protected by two chitinous plates of nearly equal development which leaves between them a narrow membranaceous band; their inner angle is rounded or cut off, and their outer margins are folded back on the anterior surface of the bead. *S. libidinosum* shows only one plate covering all the proximal part of the bead, with concave anterior margin; the plate is therefore much broader than long.

The representatives of the genus *Cyliosoma* are confined to the Australian continent and to the adjoining southern archipelagos. In this genus have been listed:—*Sphærotheirum angulatum*, Butler, 1878 (Rockhampton); *Zephronia delacyi*, White, 1859 (New Zealand); *Sphærotherium leiosomum*, Hutton (New Zealand); *Cyliosoma sennæ*, Silvestri, 1898 (Queensland); *Cyliosoma striolatum*, Pocock, 1895 (New Zealand); *Cyliosoma targionii*, Silvestri, 1898 (Queensland); *Cyliosoma unicolor*, Silvestri, 1897 (Queensland).

CYLIOSOMA QUEENSLANDIÆ, *sp. nov.*

(Plate xiv., figs. 1-4, figs. 14 and 15; with Figs. 16-21.)

♂ : length about 22. m/m.; breadth 10.50 to 11. m/m.

♀ : length about 28. m/m.; breadth 14 to 15 m/m.

Colour a uniform dark reddish or olivaceous brown, sometimes clearing up towards the anterior margin of the segments. Integuments smooth, shining.

Upper lip densely and finely punctured; rest of the head showing rare and small dimples—or coarse punctures—provided at the bottom with a tiny bristle. Posterior margin depressed in the middle. Eyes composed of about thirty-six larger and smaller ocelli, of which two stand apart behind the antenna on the ridge which closes the antennal fossa backwards. Antennæ very short, tapering; the sixth joint cylindrical; the last tipped with four sensory cones. Micrometrical measurements of the joints:—1st joint, 0.544 m/m; 2nd, 0.320 m/m; 3rd, 0.320 m/m; 4th, 0.288 m/m; 5th, 0.288 m/m; 6th, 0.544 m/m; 7th and 8th, 0.096 m/m; total length, 2.400 m/m. Diameter of first joint, 0.672 m/m; of sixth joint, 0.576 m/m.

First tergite not wider than the head; anterior margin slightly convex in the middle, otherwise straight; posterior margin evenly rounded. Its length equals 1.376 m/m; its breadth 3.776 m/m.

Lateral keels of the second tergite rounded with upraised, yet flattened centre and thickened, pad-like margins; the slope between the upraised centre and the marginal pad is flat, not grooved; a row of fleecy hair is seen inside the marginal pad. Keels of the third tergite narrow, angular. On the fourth segment, the keels are almost triangular, but gradually become more quadrangular backwards, the anterior angle being always completely rounded, while the posterior grows more or less acute. Occupying the anterior half of the keels a triangular, flattened field is to be seen, the surface of which is clothed with tiny golden setæ and appears finely punctured. Last tergite somewhat gibbous in the middle; the space between the summit and the posterior margin is scarcely noticeably flattened on each side of the middle line, the two surfaces meeting mesially without forming any distinct carina. The posterior margin shows traces of a delicate pre-marginal sulcus.

From the fourth segment backwards, the inner surface of the keels is provided with a strong horizontal ridge which stands below and near the insertion line of the pleural membrane. It is thus disposed that, in the contracted state of the body, the posterior end of a ridge comes in contact with the anterior end of the ridge of the next segment so as to form an uninterrupted projecting line upon which the lateral and part of the anterior margin of the second segment is pressed tight. On the last segment, the ridge sets forth converging with the hind margin of the tergite, but dies out before reaching it, thus leaving free the middle part of the inner surface.

Sterna of the first pair angularly produced and hairy; following sterna rounded; tracheal stigmata everywhere strongly chitinized.

Last joint of the ambulatory legs longer than the third, flattened, smooth, widely punctured. Dorsal spine standing apart from the claw; missing on the two anterior legs. The two ventral ridges normally furnished each with a row of five spines, except on the first, the second and the twenty-first where one or two of the proximal spines might be missing in the posterior row. Claw more or less sickle-shaped, with a basal tooth.

Male:—Last tergite with a transverse depression above the posterior margin. A finely and densely punctured space is seen connecting the summit of the tergite with the middle of the posterior margin; the punctures bear each a very short hair.

The posterior surface of the coxæ of the second pair show the opening of the seminal duct in the shape of a bead-like organ closing a large circular aperture cut into the surface of the coxa. The surface of each bead is protected by two chitinous plates which do not join on the middle line, and of which the outer margins are folded back on the opposite side of the bead.

Copulatory organs:—First pair very hairy. Basal joint broad, sub-quadrangular; its thinner surface is flattened and is but slightly produced into a thick and short, rounded cone. Second joint seemingly triangular; its inner margin shorter than the outer margin; its distal angle rounded, hollowed internally and furnished with small and sharp warts along its inner edge. Third joint partly engaged in the second, reduced, rounded, showing on its posterior surface, opposite the warted edge of the preceding joint, a chitinized ridge likewise provided with sharp warts.

Second pair three-jointed, shortly pilose. Anterior median horns hooked, gradually tapering from the base, apex split into two tiny rods. Posterior median processes conic, as long as the anterior horns. Second joint produced internally into a moderately long but stout and blunt process, the so-called immovable digit, the posterior-upper edge of which is furnished with small rounded warts. Third joint, or movable digit, slightly arched, with rounded apex; its inner surface is deeply excavated; its posterior edge bears a row of short transverse, concentrically wrinkled ridges which come in contact with the warts of the preceding joint when the forceps are closed; of these organs the former (the row of ridges) is termed the "harp," and the latter (the warts) is termed the "bow," as it is admitted that they act as musical apparatus.

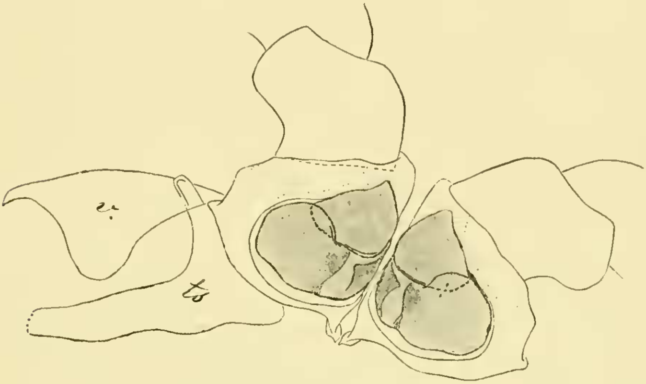

Fig. 15.—*Cyliosoma queenslandiæ.*—Coxæ of 2d pair of ♀, showing vulvæ. *v* = ventral plate; *ts* = tracheal stalk.

Female organs composed of three plates of which two are proximal, and one distal; the latter pointed. Of the two proximal plates the outer is larger than the inner; its inner margin is sinuate; its upper margin is rounded and partly overlaps the proximal margin of the distal plate.

The female is provided with an anal sternite, an organ which is not found developed in Glomeridæ. It is as long as wide at its base, in shape of a pointed arch (or ogive) and hairy along its distal end.

Loc.—Four males and three females from Gayndah, Queensland.

The above described species could have been identified with *C. targionii*, Silv., from Cairns, had not the author verified the existence on the last tergite of a very faint carina with a depression on each side, nor described and represented the process of the second joint of copulatory organs as comparatively long and acute.[4] As moreover no mention is made of the punctured band on the last tergite of male, it is to be admitted that *C. queenslandiæ* stands by itself as a distinct species.

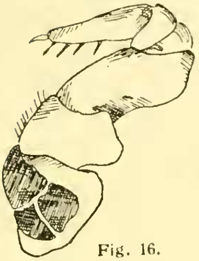
Fig. 16.

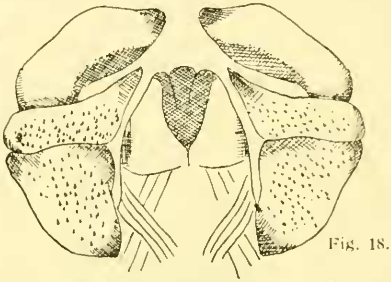
Fig. 18.

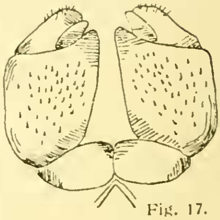
Fig. 17.

It is also closely allied to *C. unicolour*, Silv., from Gayndah.[5] Yet it differs in having the proximal joint of the first pair of copulatory organs notched in front, causing the inner process to be more distinct, longer and more slender than in *C. queenslandiæ*; moreover, the two following joints stand endwise, the distal appearing to be entirely free.

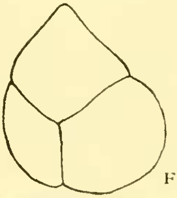
Fig. 19.

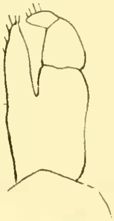
Fig. 20

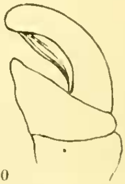
Fig. 21.

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[4] The following is a copy of Silvestri's description of *Cyliosoma targionii* (Bull. Soc. Entom. Ital., xxix., 1897, p. 228) :—

" ♀ Color niger, ventre pedibusque fusco-terreis. Caput sparse et grosse punctatum,
" circa labrum dense punctatum. Antennae perbreves, articulo sexto cylindrico,
" coteris magis attenuato et longiore. Somita : tergitum primum latum, breve.
" Tergita coetera omnia laevigata. Tergitum ultimum medium postice vix vix
" carinatum, utrimque depressum. Vulva (fig. 16) articulo superbo triangulari apice
" acuto externe aliquantum reverso. ♂ foemina minor, tergito ultimo postice dis-
" tincte carinato et utrinque depresso. Organum copulativum : par anticum (fig. 17)
" articulo secundo permagno et valde lato apice interno aliquantum producto, forcipe
" parvo digitus longitudine subaequalibus, par posticum (fig. 17) forcipis digito immo-
" bili, mobili, valde breviore, trianguliformi acuto, digiti mobili percrasso. Long.
" corp. mm. ♀ 38, ♂ 27 : lat. corp. mm. ♀ 17, ♂ 12. Hab. Cairns, Queensland."

[5] Silvestri's description of *C. unicolor* (Ber. Zool. Mus. Dresden, vi., 9, 1896/97, p. 16), reads thus :—

" Color plus minusve brunneo-viridescens totus. Caput laevigatum punctis valde
" sparsis et sat magnis impressum, vertice profunde excavato. Antennae attenuatae
" articulo 6° longiore, septimo minimo. Tergita : primum laevigatum ; secundum
" lateribus normaliter latis ; tergita coetera omnia laevigata, granulis vel punctis
" destituta. Pedes pilis brevibus vestiti, articulo ultimo infra spinis 6-7, ungue
" apicali sat brevi, multum uncinato ♀ Vulva (fig. 19) articulorum basalium externo
" maiore, articulo supero apice acuminato. ♂ Foemina minor. Organum copulativum :
" par anticum (fig. 20) forcipis digitis perbrevibus, mobili tuberculato ; par posticum
" (fig. 21) digito immobili mobili fere duplo breviore, trianguliformi, digito mobili
" crasso, spatulato, apice rotundato Long. corp. ♀ mm. 35, ♂ mm. 29 ; lat. corp.
" ♀ mm. 16, ♂ mm. 13. Hab. Nova Hollandia : Gayndah "

No more can the Gayndah specimens be identified with *C. angulatum*, Butler, 1878,[6] as the latter is said to have the anterior portions of dorsal segments densely covered with coarse but very shallow punctures.

CYLIOSOMA PENRITHENSIS, *sp. nov.*

(Plate xiv., figs. 5-7, fig. 22; with Figs. 23-25.)

♂: length about 38. m/m; breadth 12.50 m/m.

♀: length from 21. to 33. m/m; breadth from 11 to 17 m/m.

Olive chestnut, darkened along the posterior margin of the segments; darker in females which are of a muddy brown.

Head twice as broad as long; anterior margin almost straight, feebly notched in the middle and with a small, blunt tooth. Surface smooth, between the eyes with rare, coarse punctures, rugose along the upper lip; each puncture furnished with setæ. Antennal fossa open in front and below, closed above and behind by a strong ridge. Eyes composed of about thirty-two larger and smaller ocelli congregated on a rounded field; besides an isolated ocellus is seen standing somewhat apart, near and below the Tömösvary organ which is dot-like. Antennæ very short, scarcely longer than the first tergite in the middle, tapering endwards; sixth joint sub-cylindrical, more slender than any of the preceding joints; last joint tipped with four sensory cones. Micrometrical measurements of the joints: 1st, 0·430 m/m; 2nd, 0·473 m/m; 3rd, 0·387 m/m; 4th, 0·301 m/m; 5th, 0·473 m/m; 6th, 0·774 m/m; 7th and 8th, 0·086 m/m; total length 2·924 m/m. Diameter of first joint, 0·397 m/m; of 6th joint, 0·279 m/m.

First tergite not quite as broad as the head; length 2.236 m/m, breadth 5.504 m/m. Anterior margin feebly sinuate; posterior margin rounded, the curve being more flattened in the middle than on each side.

Integuments of the following segments leathery, more distinctly so on the keels than dorsally; keels of the second segments rounded with a pad-like margin; centre of the keel raised but flat. The space between the raised surface and the marginal pad is grooved (not flat, as in *C. queenslandiæ*), the inner slope being abrupt and the bottom of the groove being flat and furnished with delicate fleecy hair. Other keels as in *C. queenslandiæ* with a rather stronger inner ridge. Last tergite evenly globular, slightly depressed near the posterior margin which is delicately sulcate all round.

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[6] Butler—Trans. Ent. Soc., 1878, iv., p. 299.

Tarsi of ambulatory legs compressed, longer than the corresponding femora, except in the first and second pair where both joints are of equal length. Ventral spines do not appear to exceed five in each row. When both rows are not alike, it is the anterior which lacks of some of the proximal spines; for instance, the tarsi of the two first pair show an anterior row of two spines and a posterior row of five; the tarsi of the second and third pair show an anterior row of three spines and a posterior row of five; the tarsi of the twenty-first pair show an anterior row of four spines and a posterior row of five. The dorsal spine is missing on the two anterior pair of legs; on the other legs it stands apart from the claw. The latter is sickle-shaped with a basal tooth.

Male:—The bead-like penis is similar to the same organ of *C. queenslandiæ*; the plates do not join in the middle and are more chitinized.

Copulatory organs:—Basal joint of the anterior pair almost naked, broad and short; inner edge scarcely sinuate or even somewhat convex, ending in a triangular, short and blunt process pointing straight downwards. Inner surface concave. Second joint with rare, rather long setæ, conic; the immovable digit short with rounded apex and with an anterior surface covered with rather acute warts. Third joint small, tapering, slightly curved backwards in its distal third; its posterior surface is furnished with warts similar to those of the immovable digit.

Second pair poorly beset with short setæ except along the inner edge of the second joint and of the immovable digit, where the setæ are more dense. Anterior median horns almost parallel-sided proximally, quickly thinning out in their distal third. Posterior median processes nearly quadrangular in outline, with the outer angle rounded and the inner angle produced into a cone; the latter represent one fourth of the total length of the process, and its root is equal to about one third of the breadth of the process if measured at its base. The proximal joint of the appendages is short, of the usual form; second joint short but bearing an immovable digit nearly as long as the movable; the apex is rounded; the warts of the posterior (outer) edge are small and flat, not unlike a stone pavement. The last joint is rather stout with its end cut obliquely; the "harp" is composed of some twenty elongate nodules ornamented with delicate concentrical ridges. Standing in a line with the harp, is to be seen at the end of the digit a more chitinized space covered with minute dark dots, the nature of which could not be ascertained.

Female:—The anal sternite is very broad, and rounded; the length is equal to half of the breadth at the base; it is adorned with delicate fleecy hairs on its distal half and particularly along the posterior margin.

The opening of the sexual ducts in the coxæ of the second pair of legs is protected by three plates disposed as in the preceding species. The pistal plate is strongly chitinized, in shape of a gradually tapering cone with rounded apex, reaching slightly beyond the distal margin of the coxa. This structure seems to come very near to that of *C. targionii*, as drawn by Prof. Silvestri; but the total absence of carina and depressions on the last tergum precludes the identification of these specimens with the Queensland form.

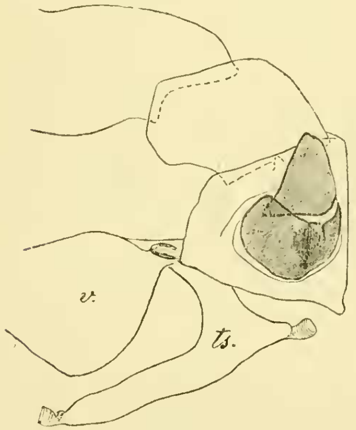

Fig. 22.—*Cyliosoma penrithensis*. Right coxa of 2nd pair of ♀, showing vulva. *v* = Ventral plate; *ts* = tracheal stalk.

One male from Penrith and three females from Cambewarra, New South Wales.

C. penrithensis is closely related to *C. sennæ*, Silv., 1898, but is to be distinguished from it on account of the following particulars :—

First pair of copulatory organs :—In *C. sennæ* the proximal joint is less broad, its length stands to its breadth as 8 to 7. Its inner margin is sinuate, the inner angle being bent outwards and less distinct, while in *C. penrithensis* the length stands to the breadth at least as 3 to 4.50 and the inner margin is differently shaped.

Second pair of copulatory organs :—The inner produced angle of the posterior median processes, if measured at its root, is as broad as half the process itself in *C. sennæ*, while it is less developed in *C. penrithensis*.

Female sexual organs :—In *C. sennæ* the distal plate rapidly thins out into a slender, acute top, the lateral margins being therefore concave and not straight as in *C. penrithensis*.

No doubt further differences would be brought to light should the types be carefully compared.[7]

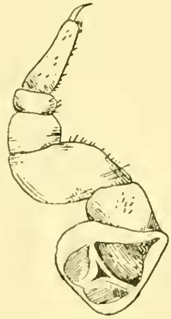
Fig. 23.

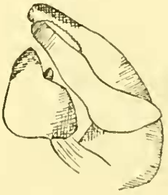
Fig. 25.

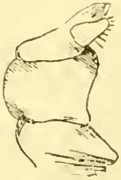
Fig. 24.

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[7] Silvestri's description of *C. sennæ* runs as follows :—

"♀ Color fusco-olivaceus, margine postico somitorum nigrescente. Caput sparse
"punctatum, circa labrum magis punctatum setigerum. Antennae breves articulis
"1-5 subaequalibus, articulo 6^{o} coeteris fere duplo longiore, cylindrico. Somita:
"tergitum primum sparse setosum, tergitum secondum in excavatione laterum
"setosum. Tergita coetera laevigata. Vulva (fig. 23) articulo supero trianguliformi,
"apice magis attenuato interne vix reverso. ♂ Foemina minor, tergito ut in
"foemina. Organum copulativum; par anticum (fig. 24) articulo secundo minus
"magno, forcipe elongato, digito mobili breviore, par posticum (fig. 25) forcipis
"digito mobili immobili parum longiore, magnitudine altero subaequali. Long.
"corp. mm. ♀ 24. ♂ 22; lat. corp. mm. ♀ 12. ♂ 10. Hab. Cairns (Queensland)."

PROTERANDRIA, Verhoeff, 1894.

POLYDESMOIDEA, Pocock, 1894.

Genus Australiosoma, *gen. nov.*

The characters of this new genus are the following : —

1. Pore formula : 5, 7, 9, 10, 12, 13, 15 to 19.

2. Keel of second tergite reaching below the level of the posterior angle of the first tergite, and of the following keels.

3. Keels more or less reduced.

4. Tarsi of male furnished below with a brush.

5. First pair of legs of male thickened, the third joint being provided with a tooth-like process.

6. Anterior part of fifth sternite bearing a more or less developed lamella.

7. Coxal aperture more or less contracted on the middle line.

8. Gonopods :—Coxal hook present. Femoral part of telopodit distinct. Telopodit more or less condensed and more or less deeply divided into three (sub. gen. *Australiosoma*) or two (sub. gen. *Dicladosoma*) branches.

Type :—*Australiosoma rainbowi*, sp. nov.

This genus is established on the four species, the descriptions of which are given hereafter. All the characters recorded are probably not of equal value ; but it has not been possible to ascertain which are to be considered as secondary, as hardly anything is known of the Polydesmids of the Australian continent, Tasmania and New Zealand.

So far the only species recorded from these regions are :—

Polydesmus (Strongylosoma) rubripes, L. Koch, 1867 ....♀: Brisbane.

Polydesmus (Strongylosoma) transverse-tæniatum, L. Koch, 1867..........................♂: Brisbane.

Polydesmus (Strongylosoma) novarræ, Humb. and Sauss., 1869 ....♂: Auckland.

Polydesmus (Strongylosoma) innotatum, Karsch, 1881	♀:	Adelaide.
Polydesmus (Strongylosoma) sagittarium, Karsch, 1881	♂:	Sydney.
Strongylosoma semoni, Attems, 1898	♀:	Queensland.
Eustrongylosoma transverse-fasciatum, Silvestri, 1897	♀:	Gayndah.
Eustrongylosoma bifalcatum, Silvestri, 1898	♂:	Cairns.

But four out of the eight species can afford no useful indications, as they are known only from female specimens. Nothing is to be made out of the embryonary description of a fifth species, *S. sagittarium*, Karsch. Three more species remain, the copulatory organs of which are known through sketches given by their authors; and this makes it possible to compare them with *Australiosoma*.

For instance, there is hardly any doubt that *S. novarræ* is closely related to the continental forms. Attems' drawing[8] shows coxa of the gonopods to be crooked, and the femora to be very distinct; also Humbert & Saussure's description mentions "chez le mâle, entre les pattes de la première paire du cinquième segment, une apophyse courte, arrondie et comprimée transversalement." On the other hand, the development of the keels (which is indeed of little importance), and the shape of the gonopods, with long outstretched tibia and short rudimentary branches, indicates that *S. novarræ* has to be held as an aberrant form showing traces of evolution[9]; it will, therefore, be probably found necessary to isolate this species from the bulk of the continental *Australiosoma*, when the limits of variation of the characters of the latter become better known.

As regards *S. transverse-teniatum* and *Eustrongylosoma bifalcatum*, it may be safely assumed that they belong to the new genus, judging from the shape of the gonopods which bear a striking resemblance to the same organs of *A. rainbowi* and of *A. froggatti*. Yet nothing is known as to the presence of secondary sexual characters, the authors remaining silent on this point. That such a blank should exist in Prof. Silvestri's text is not surprising, as the diagnosis of *E. bifalcatum* is shortened, and the fact that the matter was left unspoken does not imply that the secondary characters do not exist. As to *S. transverse-tæniatum*, which has been redescribed at length by Attems, it is more astonishing that the Austrian author, whose writings rank amongst the best, should have neglected to mention the structure of the first pair of legs and of the fifth sternum. Are we to understand that these organs show no special feature, or are we to admit that, the specimens being curled up, these particulars have escaped his attention? The matter is not easy to decide; and should the first alternative prove to be the right one, it would become necessary to somewhat alter the above given diagnosis of the genus. For this reason, some of the characters mentioned therein, and namely the characters numbered three to seven, should not be entirely relied upon until they have undergone further test.

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[8] Attems—System der Polydesmiden, I, 1898, Pl. iii., fig. 58.

[9] A similar case, though less characterized, will be found hereafter in *Australiosoma kosciuscovagum*.

Thus far the genus *Australiosoma* includes six species, *i.e.*:—*A. transverse-tæniatum*, L. Koch, 1867, *A. bifalcatum*, Silvestri, 1898, *A. rainbowi*, *A. froggatti*, *A. kosciuscoragum* and *A. etheridgei*, spp. nov.

In all six cases the gonopods show the following particulars:—The coxa is crooked, with a prominent anterior surface adorned with some fleecy hairs (*cox.* Pl. xiv., figs. 14, 22); no trace of the anterior marginal process is to be seen; the inner hook is normally developed. The femur is distinctly outlined (Pl. xiv., figs, 9, 14, 18), the limits being often grooved; its surface is abundantly clothed with setæ, more dense and much longer in the vicinity of the proximal opening of the seminal duct. The tibia is generally condensed and the telopodit deeply split (less so in *A. kosciuscoragum*, which is a mountain dweller, and has evidently been differently affected by evolution); the tibial branch starts from the posterior (Pl. xiv., *tb.*, fig. 8), or from the outer (Pl. xiv., *tb.* fig. 14; Pl. xv., figs. 18, 21) surface of the telopodit.

Besides the seminal and the tibial branch, a third process is generally to be seen starting from the telopodit more distally than the tibial branch; and this has to be identified as a tarsal branch (Pl. xiv., *tab.* figs., 8, 13; Pl. xv., fig. 18). Yet its existence does not appear to be as constant as that of the tibial branch; no trace of it is found in *A. etheridgei* (Pl. xv., fig. 21). As moreover the tibial branch assumes in this species a shape not met with in the other members of the genus *Australiosoma* (being widened and hollowed proximally so as to shelter the base of the seminal branch), it has been found necessary to isolate same and to erect a special sub-generic division for its reception.

The genus *Australiosoma* will, therefore, be divided into two sub-genera:—

1. AUSTRALIOSOMA *(sensu stricta)*, the gonopods of which are split into three branches.
2. DICLADOSOMA, the gonopods of which are split into two branches, the other generic characters remaining identical in both divisions.

Amongst the known continental *Australiosoma*, a species has been mentioned above, which has been ascribed by its author to the genus *Eustrongylosoma*:—*E. bifalcatum*, Silvestri, 1898, from Cairns, Queensland. It has not been found convenient to use this generic name for the continental forms hereafter described, as:—1st, no full description has been given of the genus, and 2nd, while as much as can be understood from Prof. Silvestri's writings, the continental *Australiosoma* seem different from the New Guinea type specimen of *Eustrongylosoma*, *E. fasciatum*, Silv., 1894.

The name *Eustrongylosoma* was created by Prof. Silvestri[9A] in 1896. No description was given, as already stated; but, the genus being included in an analytical key of his Polydesmidæ,[10] it may be inferred, from the terms of the key, that its characters are the following:—

Pores opening sideways in the keels of the segments 5, 7, 9, 10, 12, 13, 15 to 19.

Keels small, linear, with posterior angle not produced; keels of second segment produced below the level of the keels of segments 1 and 3.

[9A] Silvestri—I Diplopodi; Parte 1, Sistematica. Ann. Mus. Civ. Stor. Nat. Genova, (2), xvi., 1896, p. 198.

[10] It is to be observed that Silvestri's family by no means answers the likewise named division of other authors.

Last segment more triangular (than in *Anoplodesmus* and *Leptodesmus*).

Tergites destitute of warts.

Sternite unarmed.

Warts of the anal sternite small, not exceeding the apex of the sternite.

Trochanter of ambulatory legs spineless; other joints subequal, the femur not being twice longer than the tibia.

Pleuro-sternal suture not keeled (this last character is supposed to separate *Eustrongylosoma* from *Strongylosoma*, Brandt).

Not a single word is said of the structure of the copulatory appendages, and the genus thus appears so doubtful, that Dr. Attems, in his well-known "System der Polydesmiden," was led to consider Silvestri's denomination as synonymous with *Strongylosoma*.

To *Eustrongylosoma* is ascribed, as type specimen, the New Guinea *Strongylosoma fasciatum*.[11] No figure of the gonopods was given, but it is said in the diagnosis :—"♂: pedum omnium articulus ultimus infra setosissimus; pedes copulativi simplices, apice multo recurvato circulum fere formante." The gonopods of *E. fasciatum* being undivided, "simplices," it is utterly impossible to place beside it the continental forms with condensed and split telopodit.

One more word is to be added concerning *Australiosoma*. Attems, when re-describing Koch's *A. transverse-tæniatum*, states:—"Die Copulationsfüsse erinnern durch die tiefe Spaltung eher an die von *Leptodesmus*." But a main criterion escaped Attems' attention, and that is how differently constructed are the coxæ of Strongylosomids and Leptodesmids. Nevertheless, a similarity exists in the telopodit and is to be held as a highly instructive case of parallelism. From it we learn that, in continental regions where a special group of Polydesmids seems to find the most and more favorable conditions for their existence, the evolution tends to complicate the gonopods by favouring the condensation of the telopodit and the growth of its processes. Whilst around such regions, taken as centres, in surrounding mountain ranges or in isolated lands and islands, the condition of life are different enough to slacken or alter the action of evolution. Yet it is to be expected that, under the latter conditions, forms will crop out more perfect under some other point of view still to be ascertained. Such is the case for Leptodesmids in South America, and will likely prove to be the case for Strongylosomids in the Australian continent and surroundings.

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[11] Silvestri—Ann. Mus. Civ. Stor. Nat. Genova (2), xiv., 1894-5, p. 642.

The following is an analytical key to the six known species of *Australiosoma* :—

1 (2)—Body with a transverse yellow stripe on the posterior half of metazonite.........*A. transverse-tæniatum*, L. K.

2 (1)—Body without transverse yellow stripes..............3

3 (6)—Body of an uniform colour, or, should the dorsal part appear lighter, no definite longitudinal bands are seen...4

4 (5)—Distal part of seminal branch of gonopods gradually thinning out into a spine-like apex ; posterior branch two thirds the length of the seminal branch ; end of anterior branch not expanded.............................
A. bifalcatum, Silvestri.

5 (4)—Distal end of seminal branch divided into three tines ; posterior branch nearly as long as the seminal branch ; end of the anterior branch spade shaped.......
A. froggatti, sp. nov.

6 (3)—Body with one or two defined light-coloured dorsal bands...7

7 (8)—Anterior margin of coxal aperture of gonopods with a large, horizontal lap produced backwards ; posterior margin without process ; posterior (outer) branch of gonopods blade-like, curved outside the organ.......
A. kosciuskoragum, sp. nov.

8 (7)—Anterior margin of coxal aperture of gonopods without a lap ; posterior margin with a strong tooth-like process directed downwards...9

9 (10)—Gonopods divided into three branches; posterior branch not overhanging the femur proximally, gradually thinner, curled inside the organ............................... *A. rainbowi*, sp. nov.

10 (9)—Gonopods divided into two branches; posterior branch with broad base, overhanging the femur externally, expanded distally on the outer surface of the organ...... *A. (Dicladosoma) etheridgei*, sp. nov.

AUSTRALIOSOMA FROGGATTI, *sp. nov.*

(Pl. xiv., figs. 8-12).

(a) ♂ type: length 47 m/m; breadth of 12th tergite 4.20 m/m, of 12th prozonite 3.10 m/m.

(b) ♂: length 48 m/m; breadth of 12th tergite 4.30 m/m.

(c) ♀: length 42 m/m; breadth of 12th tergite 4.25 m/m.

Ground colour, a very dark brown, reddish on the dorsal surface and below the keels. Ventral side and the three proximal joints of the legs yellow-brown; the three distal joints of the legs reddish-brown to dark brown.

Head smooth, pilose behind the labrum, wrinkled and swollen behind the antennæ causing the vertex to appear flattened. Median sulcus distinct on the vertex, short not reaching the base of the antennæ, not branched. Lateral margins of the head much swollen below the antennal sockets. The latter not sunken, standing close together (0.73 m/m apart). Antennæ long and slender, reaching as far back as the suture of the third segment in the male, as the posterior margin of the second segment in the female; shortly pilose from the second joint; four sensory cones. Micrometrical measurements of the joints:—1st, 0.416 m/m; 2nd, 1.216 m/m; 3rd, 1.152 m/m; 4th, 1.056 m/m; 5th, 1.088 m/m; 6th, 0.992 m/m; 7th and 8th, 0.160 m/m; total length, 6.08 m/m.

Integuments smooth, dull on the prozonite, strongly shining on the metazonites, the latter with scarcely perceptible irregular wrinkles towards the posterior end of the body.

Tergites and keels similar in shape to *A. rainbowi*, transversely furrowed from the fifth to the seventeenth segment. From the fifth segment the body is flattened (Pl. xv., fig. 10) while it remain convex in *A. rainbowi*. The dorsal surface of the keels of second segment appears less hollowed. Suture indistinctly granular. Pores as in *A. rainbowi*. Last segment leathery or wrinkled towards the apex, which is truncate; the usual setæ are not mounted on granules.

Valves globular, smooth or scarcely wrinkled in the angles, with shining, raised margins and a pair of setæ on each side. Anal sternite rounded with a pair of marginal setæ. Ventral plates unarmed, with some long fleecy hair inside the base of the legs, and with distinct transverse and longitudinal impressions. Pleuro-ventral ridges recognizable only on the third and fourth segments, simply swollen on the following.

Legs long; as long in the posterior end of the body as in the middle (tenth pair = 5.90 m/m; thirty-first pair = 6 m/m), shortly pilose. Third joint distinctly longer than the breadth of the corresponding sternite; last joint shorter than the third.

Male:—The brush which adorns the ventral surface of the tarsi of anterior legs is poorly furnished with setæ and quickly thins out after the seventh pair of legs. First pair thickened and provided with a blunt tooth below the third joint (Pl. xiv., *a* fig. 17 = *A. rainbowi*); claw rudimentary, rounded. Between the coxæ of the fourth pair of legs is to be seen a conspicuous perpendicular, sub-quadrangular lamella (Pl. xiv., figs. 11 and 12), growing broader distally, the margin of which is somewhat sinuate with rounded angles; the anterior surface is swollen and clothed with very short hairs, while the posterior surface is naked and bears two shallow impressions. The sternite of the sixth segment is hollowed to lodge the copulatory appendages at rest, the excavation being shallow and without definable limits.

The coxal aperture of the gonopods has its anterior margin feebly sinuate and without median angular plate; its posterior margin is destitute of any tooth-like process, being simply angular, the two coxal sockets thus communicating more broadly in the middle than in *A. rainbowi*.

Coxæ of gonopods (Pl. xiv., figs. 9 and 10) protruding out of the coxal aperture, more so than in any other species of the genus; telopodits also proportionally longer. Gonopods entirely independent from one another. Coxa longish, crooked above the middle, with its anterior surface flattened in its proximal half, adorned with numerous fleecy hairs in the distal half. No marginal process. Hook thick at the base and gradually tapering. Tracheal stalk moderately long, flattened, curved.

Femoral part distinct; it is produced angularly on the posterior surface where it is clothed with numerous and long fleecy hairs.

Telopodit split into three branches, of which the posterior *(tb.)* is, in its turn, divided into two thin rods almost straight and somewhat shorter than the other branches. Before preparing for microscopical examination, the two rods were so closely coupled that it was not possible to distinguish one from the other (Pl. xiv., fig. 8); the disjoining was realized through boiling in potash. The anterior branch *(tab.)* is flattened, ribbon-shaped, slightly sinuate and of equal breadth up to a point near the end where it is abruptly curved and expands into a short and wide, spade-shaped lamella. The seminal branch *(sb.)* is sinuate and swerved outwards in its proximal half; it is flattened and slightly widened afterwards, then it bends abruptly inward before the apex which is divided into three short tines; of these, two are acute, the third being sub-quadrangular; the seminal duct opens in the median spine-like tine.

Female:—The coxæ of the second pair of legs bear two granular warts placed side by side on the distal half of the posterior surface.

Three specimens from Mount Sassafras. Shoalhaven District.

AUSTRALIOSOMA RAINBOWI, *sp. nov.*

(Plate xiv., figs. 13-17; Fig. 26.)

(a) ♂ type: length 41 m/m; breadth of 12th tergite 4.50 m/m, of 12th pro-zonite 3.30 m/m.

(b) ♀: length 41 m/m; breadth of 12th tergite 4.80 m/m.

(c) ♀: length 42 m/m; breadth of 12th tergite 4.80 m/m.

(d) ♀: length 43 m/m; breadth of 12th tergite 5. m/m.

(e) ♀: length 44 m/m; breadth of 12th tergite 5.25 m/m.

(No. 22).

(f) ♀: length 43 m/m; breadth of 12th tergite 5.20 m/m. (No. 24).

Ground colour very dark, blackish; carinæ orange-yellow; two narrow dorsal yellow bands divided by a reddish-brown line begin at the posterior margin of the first segment and run through to the apex of the last segment. Legs brownish, growing darker towards the end.

Head smooth, except behind the labrum where the face is pilose and sometimes uneven, and also occasionally above the antennæ, where some tiny wrinkles may be seen; surface rather swollen behind the antennæ, wherefrom the vertex appears flattened; median sulcus wide in the middle, linear backwards and between the antennæ, where it disappears abruptly. Antennæ standing close together (0.80 m/m apart), long and slender, reaching the posterior margin of the third segment; pilose from the second joint, more densely towards the apex, which bears four sensory cones. Micrometrical measurements of the joints: 1st, 0.50 m/m; 2nd, 1.25 m/m; 3rd, 1.20 m/m; 4th, 1.15 m/m; 5th, 1.10 m/m; 6th, 0.95 m/m; 7th and 8th, 0.15 m/m; total length: 6.30 m/m.

Integuments smooth and scarcely shining, with more or less distinct, irregular, mostly branched striæ, lacking orientation, and, towards the posterior end of the body, with some irregular, longitudinal wrinkles. First tergite with a vague transverse median impression; anterior margin straight in the middle, oblique on each side; posterior margin scarcely concave; posterior angle rounded, with a marginal furrow. Second tergite with small but well characterized, sloping keels reaching below the posterior angle of the first tergite; margins raised, causing the surface to appear hollow; anterior angle rounded; posterior angle slightly produced and rounded. From the third segment the keels are considerably reduced and located rather low; anterior angle entirely rounded; posterior angle not produced beyond the level of the posterior margin of the segment, yet somewhat acute owing to the fact that the posterior margin is slightly excised; suture beset with a row of very fine granules. From the fifth segment to the seventeenth, the metazonites are divided into two subequal halves by a distinct transverse furrow. Pores opening sideways near the posterior angle of the keels of the segments 5, 7, 9, 10, 12, 13, 15 to 19. Last segment gradually narrowed, with apex truncate, smooth. Valves, globular, smooth, with shining, raised margins and a pair of setæ on each side. Anal sternite rounded, with a pair of marginal setæ.

Ventral plates very hairy, showing a vague transverse impression and no spines. Pleurosternal suture ridged on the segments 2, 3 and 4, scarcely swollen and smoothed backwards, except perhaps on the sixth somite where the swelling is tipped with a tiny granule near the posterior margin of the segment. Stigmata opening in small yellow granules. Legs long, growing longer backwards; on a ♂ specimen a leg of the tenth pair measured 5.25 m/m, a leg of the thirty-first pair measured 6 m/m. Joints clothed below with fleecy hair; third joint longer than the breadth of the corresponding sternite; sixth shorter than the third.

Male:—Last joint of the legs furnished with a thick brush (Pl. xiv., fig. 17). Joints of the first pair thickened; the third joint is considerably swollen and is provided with a strong blunt tooth on its lower surface; claw, strong, acute. The fifth segment bears, between the coxæ of the fourth pair, a very prominent lamella slightly curved backwards (Pl. xiv., fig. 16), almost as wide as long, the anterior and posterior sides of which are hairy and the margin rounded and shining. The ventral plate of the sixth segment is widely excavated to shelter the copulatory appendages at rest.

The coxal aperture of the gonopods (fig. 26) is composed of two semicircles placed side by side and fused on the middle line. The anterior margin is upraised; it is almost straight, but is interrupted in the middle by a small triangular, horizontal plate pointing backwards. The posterior margin of the aperture is sinuate and bears on its median curve a very strong and long tooth placed perpendicularly, the proximal part of which dips in the coxal aperture while its distal end, compressed laterally, stands upright between the gonopods. The space left between the anterior triangular plate and the posterior perpendicular tooth is small indeed, as shown in fig. 26.

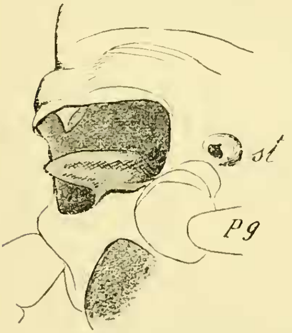

Fig. 26—*Australiosoma rainbowi*.—Side view of coxal aperture of gonopods. *st.* = Stigmata; *p9* = 9th pair of legs.

Gonopods entirely independent of one another. Coxæ longish somewhat crooked distally, with posterior distal margin slightly produced but without any marginal process; some fleecy hairs are seen on its anterior surface. Coxal hook of usual length and shape.

Tracheal stalk (Pl. xiv., fig. 14) moderately long, flattened, slightly curved. Femoral part of telopodit angularly produced on the posterior surface and very hairy. Telopodit (Pl. xiv., figs. 13 and 14) split in three branches of even length. Tibial branch *(tb.)* moderately wide, gently arched, flattened distally, gradually tapering, then abruptly enlarged at the apex, which is rounded, except in its anterior angle which is producod into a short, acute spine. Tarsal branch *(tab.)* winding inwards, angular along its posterior edge near the base, slowly but regularly narrowed afterwards, and with an acute apex. Seminal branch *(sb.)* curved, gradually narrowed, with a short process below the middle of its outer edge *(x.)*

Female:—Coxæ of the second pair provided with a low, rounded, but strongly chitinized crest on the outer edge of its posterior surface.

Six specimens from Mount Sassafras, one male and five females.

AUSTRALIOSOMA KOSCIUSKOVAGUM, *sp. nov.*

(Plate xv., figs. 18-20; Fig. 27.)

(a) ♂ type: length 48 m/m; breadth of 12th tergite 5 m/m, of 12th prozonite 4.20 m/m.

(b) ♀: length 46 m/m; breadth of 12th tergite 5.60 m/m.

Colour as in *A. rainbowi*; dark red-brown background with a dorsal yellow-brown band extending from the anterior margin of the first segment to the apex of the last, divided into two stripes by a brown median line. Keels tipped with yellow. Pleural and ventral surface more reddish. Antennæ and legs dark.

Head smooth, except behind the upper lip where the face is rugose and hairy. Vertex swollen on both sides, not particularly flattened in the middle, with a median sulcus feebly impressed and indistinctly branched between the antennæ.

Antennal groove strongly wrinkled. Lateral margins strongly swollen outside the antennal sockets. Antennæ standing close together (♂ : 0.80 m/m apart), moderately elongate, not reaching (♀) or scarcely over-reaching (♂) the posterior margin of the second segment, slender, shortly pilose, tipped with four sensory cones. Micrometrical measurements of joints : 1st, 0.480 m/m ; 2nd, 1.152 m/m ; 3rd, 1.280 m/m ; 4th, 1.248 m/m ; 5th, 1.216 m/m ; 6th, 0.992 m/m ; 7th and 8th, 0.256 m/m ; total length, 6.624 m/m.

The Tömöswary organ realises a growth so far unrecorded amongst Polydesmids ; it is to be seen as a pale yellow, transverse and transparent low swelling, in the shape of a crescent with rounded inner angle, located exactly behind the antennal socket; in the other species, this organ is consiberably smaller, dot shaped, and stands in the antennal fossa, behind and close to the antennal socket.

First segment smooth. Anterior margin straight in the middle, gently arched on each side ; posterior angle rounded and slightly thickened, with a marginal sulcus ; posterior margin feebly excised. Keels of the second segment very small, with rounded anterior angle (more rounded than in other species), reaching downward far below the posterior angle of the keel of first segment. The margins of the keel are somewhat incrassate, and its surface is not so strongly grooved as in *A. rainbowi.*

Integuments scarcely shining, with indistinct wavy sort of striæ lacking orientation. Keels considerably reduced, rounded anteriorly ; posterior angle rounded on the anterior segments and gradually less prominent backwards. Suture densely beset with minute longitudinal striæ. From the fifth segment to the seventeenth, the metazonite show a very shallow transverse impression and a thin sulcus growing fainter on the sixteenth and seventeenth segments ; yet the body is not flattened as in *A. froggatti* (Pl. xv., fig. 20). Pores opening sideways in the keels 5, 7, 9, 10, 12, 13, 15 to 19. Last segment of the usual conic shape, with as few setæ as in the other species. Valves globular, with no distinctly raised margins, but with a pair of low granules tipped with setæ on each valve. Anal sternite large, rounded, yellow, with a pair of marginal setæ.

Ventral plates spineless, hairy, with the usual cross-impressions well marked. Pleurosternal suture with a fine ridge on the segments four to seven, simply swollen on the following and growing more and more faint towards the posterior end of the body. Stigmata opening in small, dark coloured granules. Legs long; not longer at the posterior end than in the middle of the body; pilose; third joint longer than the breadth of the corresponding sternite (in the proportion of 3 to 2.5); last joint distinctly shorter than the third.

Male:—The last joint of all legs and the distal half of the fifth joint are furnished below with a thick brush. First pair of legs similar to that of *A. rainbowi*, thickened, and with a strong blunt tooth on the anterior surface of the third joint; claw normal, acute. The intercoxal lamina of the fifth sternite is similar to that of *A. froggatti*, large, filling all the space between the coxæ of the fourth pair, turned onwards, wider distally, but less thickened with distal angles, less rounded and somewhat more straight margin.

The coxal aperture of the gonopods has quite a special structure (fig. 27). The posterior margin is angularly produced, but shows no trace of a tooth as seen in *A. rainbowi* or *A. etheridgei*. The anterior margin, on the contrary, is upraised, excised on each side, angular outwardly, and provided in the middle with a large horizontal lap, the apex of which is rounded, overhanging the aperture and reaching as far back as the level of the posterior margin, so that, to a superficial observer, the coxal aperture might appear to be divided into two sockets.

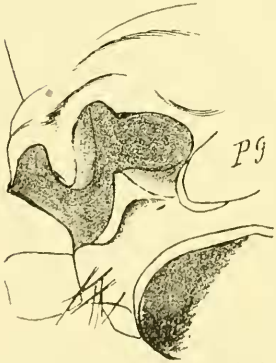

Fig. 27.—*Australiosoma kosciuskovagum.*—Side view of coxal aperture of gonopods. *p9* — 9th pair legs.

Gonopods (Pl. xv., figs. 18 and 19) entirely independent from one another. Coxæ of normal shape; the posterior distal margin is feebly produced; no anterior distal process. Tracheal stalk moderately elongate, flattened, arched. Femoral part of the telopodit distinctly outlined all round, somewhat produced posteriorly, very hairy. The rest of the telopodit is not deeply split, in order that a compressed tibial stem may be distinguished (Pl. xv., *T.* fig. 18), the outer angle of which ends into a short, scythe-shaped process *(tb.)*, with acute apex turned inwards. Further on, the telopodit is divided into two more branches. The seminal branch *(sb.)* is lamellar and leaf-shaped, while the posterior branch *(tab.)*, gently arched inside, end into two long and slender horns.

Female :—Coxæ of the second pair of legs with posterior surface much swollen and strongly chitinized, but without crest or warts.

Two specimens, male and female, from Pretty Point, Mount Kosciusko.

AUSTRALIOSOMA (Dicladosoma) ETHERIDGEI, *sp. nov.*

(Plate xv., figs. 21, 22.)

♂ type : length 31 m/m ; breadth of 12th tergite 3 m/m, of 12th prozonite 2.70 m/m.

Ground colour dark brown, with a pale brownish yellow band, contracted at the suture and enlarged towards the posterior margin of each segment, running through from the anterior margin of the first segment to the apex of the last. Pleuræ a dull red-brown ; legs dark madder.

Similar to the preceding species in many respects, such as shape of the first segment, form and development of keels, pore formula, male secondary characters : yet of smaller size and with different copulatory appendages.

Head smooth, not shining ; upper lip hairy, but face almost naked : lateral margins swollen ; vertex swollen on each side behind the antennæ, with well marked, not distinctly branched sulcus ; antennal grooves wrinkled. Tömösvary organ dot-shaped. Antennal sockets not sunken. Antennæ of moderate length, slender, shortly pilose, standing close together (0.51 m/m apart), with four sensory cones. Micrometrical measurements of joints : 1st joint, 0.320 m/m ; 2nd, 0.736 m/m ; 3rd, 0.736 m/m ; 4th, 0.704 m/m ; 5th, 0.704 m/m ; 6th, 0.672 m/m : 7th and 8th, 0.256 ; total length, 4.128 m/m.

Integuments smooth ; prozonite dull, metazonite shining. Posterior angle of the first tergite rounded and with a marginal sulcus. Anterior angle of second tergite reaching below the posterior angle of the preceding keel, only moderately rounded, and with a minute tooth pointing outwards; posterior angle somewhat overreaching the level of the posterior margin. Keels of the following segments very small, pad-shaped, thickened on the poriferous segments, completely rounded anteriorly, with posterior angle distinct as in *A. rainbowi*. Suture neatly sulcate, more coarsely than in *A. kosciuscoragum*, appearing granular. Metazonites five to seventeen somewhat flattened and divided by a well marked transverse sulcus, the bottom of which is punctured. Pores opening sideways at a small distance of the posterior angle of the keels 5, 7, 9, 10, 12, 13, 15 to 19. Last segment of the usual form. Setæ not mounted on granules. Valves globular, strongly shining, with thin upraised margins and a couple of low setiferous granules on each side. Anal sternite yellow, large, rounded, with a pair of marginal setæ.

Sternite of segments spineless, hairy, with well marked cross impressions. Pleurosternal suture adorned with a tiny arched ridge on the segments three, four and five, quickly disappearing backwards. Legs moderately long, almost naked above, pilose below. Third joint scarcely longer than the breadth of the corresponding sternite; sixth joint but a trifle shorter than the third.

Male:—The brush which adorns the ventral surface of the tarsi is dense and thins out only in the last pair of legs. First pair of legs thickened, with a blunt tooth on the anterior surface of the third joint; claw normal. The sternal lamella of the fifth segment is rectangular, not wider distally, slightly curved, pointing onwards and downwards; it is shortly pilose on its anterior surface. The sternite of the sixth segment is simply flattened, not excavated.

The coxal aperture resembles that of *A. rainbowi*, in being provided with a strong tooth projecting far out above the level of the body; yet the anterior margin is not as straight; it is strongly and angularly produced backwards, the aperture being thus considerably contracted on the middle line. In front of the outer angles of the aperture, thick ridges are to be seen directed obliquely onwards, the outer end of which is abruptly rounded while the inner die out before meeting on the middle line of the body. The legs of the ninth pair are strongly driven aside.

Distance between the gonopods much larger than in the preceding species. Coxæ and tracheal stalk of the usual form. Femoral part of the telopodit very distant. Tibia much condensed and enlarged, showing a rounded lap (Pl. xv., *a.* fig. 21) hanging down on the outer surface of the femur. The telepodit (Pl. xv., figs. 21 and 22) is deeply split into two branches of unequal length. The outer, tibial branch (*th.*), the longest. is wide, hollowed at the base, with coiled margin; it is curved inwards at its distal third, and thins out in a conspicuous long horn the end of which is bent onwards; it furnishes a thin awl-shaped process in the middle of its anterior edge *(b)* and a short and acute triangular piece at the base of the distal horn *(c)*. Inner seminal branch *(sb.)* short and more slender; its base rests in the concavity of the tibial branch; it is curved inwards at its distal thirds; the end is lamellar and divided into rounded lobes at the side of which opens the seminal duct.

Female unknown.

One male specimen from Pretty Point, Mount Kosciusko.

IULOIDEA, Pocock, 1894.

SPIROBOLIDÆ, Bollman, 1893.

The species hereafter described may be tabulated as follows:—

1 (2)—Metazonites bearing eight to twelve strong ridges ending backwards in stout conic spines, symetrically disposed along the posterior margins........................ *Acanthiulus blainvillei*, Le Guillon.

2 (1)—Metazonites not spined along the posterior margin...3.

3 (6)—Sides of the first tergite reaching the ventral surface of the second segment. Prozonites marked with horse-shoe shaped punctures...4.

4 (5)—Sides of first tergite triangular with blunt apex. Posterior gonopods connected by a bridge, the two joints standing at a right angle. Tracheal stalk of anterior gonopods short, directed upwards and reaching the base of the tibia .... *Spirostrophus digitulus*, sp. nov.

5 (4)—Sides of first tergite nearly quadrangular with rounded outer margin. Posterior gonopods independent, the two joints standing in a line. Tracheal stalk of anterior gonopods long, dipping inside the body.............. ......
Spirobolellus rainbowi, sp. nov.

6 (3)—Sides of first tergite falling short of the ventral surface of the second segment. Prozonites smooth, striate or sulcate, and, when punctured, the punctures are by no means horse-shoe shaped................................ ...7.

7 (8)—Posterior margin of segments excised in correspondence with the scobinas of the following segment..............
Dinematocricus lanceolatus, sp. nov.

8 (7)—Posterior margin of segments not excised........... ...9.

9 (10)—Dimple of the scobina small, circular, not wider than long. Inner branch of posterior gonopod located immediately above the basal swelling. Ventral posterior margin of 7th segment upraised into a thick, prominent, transverse ridge..
D. (Cladiscocricus) falcatus scobinula, subsp. nov.

10 (9)—Dimple of the scobina transversely developed, always distinctly wider than long. Inner branch of posterior gonopod located at a distance of the base of the joint nearly equal to its length.[12] Ventral ridge of 7th segment not thickened and less prominent..............11.

11 (12)—Dimples of scobinas entirely open frontwards and located on the anterior margins of the zonites which seems to be excised. Metazonite deeply sulcate dorsally, the sulci separated by low rounded ridges..............
Dinematocricus carinatus, Karsch.

12 (11)—Dimples of scobinas distant from the anterior margins of the zonites, closed frontwards...... ....13.

13 (16)—Distance between the dimples of the scobinas not exceeding once and a half the diameter of a dimple...14.

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[12] The characters borrowed from the male organs could not be verified in *D. consimilis*, the only representative of which is a female.

14 (15)—Dimples of the scobinas twice as wide as long, rounded at its ends, the bottom being raised and convex; posterior zone without distinct striæ..............
Dinematocricus faucium, sp. nov.

15 (14)—Dimple of the scobina nearly five times as wide as long, with acute ends and concave bottom; the posterior zone distinctly striate..............................
Dinematocricus consimilis, sp. nov.

16 (13)—Distance between the dimples at least three times the diameter of one of them..... .... 17.

17 (20)—Distal process of the ventral plate of anterior gonopods as long as, or longer than the proximal part. Integuments without silky lustre...................... 18.

18 (19)—Legs chestnut. Posterior part of prozonite with a transverse dorsal sulcus. Valves not particularly prominent, and but slightly compressed. Distal process of ventral plate of anterior gonopods slightly narrowed at the base, rather linguiform. Four antennal sensory cones......*Dinematocricus disjunctus*, sp. nov.

19 (18)—Legs dark. Posterior part of prozonite without transverse dorsal sulcus. Valves with a distinct premarginal impression, very prominent, with upper angles unusually thickened. Distal process of ventral plate of anterior gonopods gradually narrowed from the base to the apex. Fifteen antemnal sensory cones..............
Dinematocricus analis, sp. nov.

20 (17)—Distal processes of the ventral plates of anterior gonopods half as long as the proximal part. Integuments densely beset with minute striæ, showing a silky lustre
Dinematocricus holosericeus, sp. nov

Genus Acanthiulus, *Gervais*, 1844.

(? Syn.: *Polybunolobus*, Pocock, Ann. Mag. Nat. Hist.
(7), xii., 1893).

Anterior gonopod somewhat as in *Trigoniulus*. The proximal part of the ventral plate (Pl. xv., *c*. fig. 23) extends laterally around the base of the organ; it is fused with its outer lobe *(ol.)*; it is seen to end on the posterior face of the organ, where it meets the tracheal stalk. The latter is short, widened distally, its end being directed upwards and leaning against the base of the tibia. The coxo-femur *(cf.)* is shell-shaped with a concave posterior surface; when viewed from the anterior surface, it entirely conceals the tibia; its edges are folded back on the sides of the organ, but do not encroach on the posterior surface. The tibia *(t.)* is short and wide, lodged in the concavity of the preceding joint.

Posterior gonopods connected together by a chitinized bridge (Pl. xv., fig. 25). Each gonopod is two-jointed; the proximal joint is constructed as in *Trigoniulus* and shelters the basal, bladder-like swelling of the seminal duct, in which opens the so-called prostatic duct. The distal joint is a stout and comparatively short, feebly curved organ, the outer surface of which is strongly convex and smooth, while the inner is deeply excavated, thus offering some resemblance with a tablespoon. The concavity is lined with a soft membrane. The seminal duct is twisted above its basal swelling and is seen to wind its way in the membranaceous lining of the distal joint, and to open above the middle of the concavity of the joint. Tracheal stalks normal, as in *Trigoniulus*.

Labral dimples 2 + 2. Pores opening in the prozonite.

The Genus *Acanthiulus* was created by Gervais[13] with *A. blainvillei*, Le Guillou, as type specimen; no detailed description of the sexual appendages has ever been given.

The same species has been redescribed by E. Daday de Deés under the name of *Spirobolus dentatus*[14] but the figures given by the Hungarian scientist (Pl. iii., figs. 6 and 7) only represent the anterior gonopods and leave many particulars in the dark.

The author[15] endeavoured to analyse the copulatory appendages of a similar species, *Acanthiulus maindroni*, Bouvier; but the said species happens to belong to the genus *Eucentrobolus*, contemporaneously proposed by Pocock[16] for an Indian species, *E. tamulus*.

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[13] Gervais—Ann. Sc. Nat., Zool. (3), ii., 1844.

[14] Daday—Term. Füz., xvi., 1893, p. 101.

[15] Brölemann—Le genre *Acanthiulus*, Ann. Soc. Entom. France, lxxii., 1903, p. 469-477, pl. viii.

[16] Pocock—Ann. Mag. Nat. Hist. (7), xii., 1903, p. 528.

The main difference between the two genera lie in the following particulars :—

1st. Whereas, in *Acanthiulus*, the joints of the posterior gonopods are entirely free (movable) as in *Trigoniulus*, in *Eucentrobolus*, both joints are fused together into a single piece, in which the place formerly occupied by the once existing articulation is marked by oblique folds.

2nd. The posterior gonopods of *Eucentrobolus* are poorly chitinized, compressed, sickle-shaped organs, not unlike the similar organs of *Epitrigoniulus*. On the contrary, in *Acanthiulus*, they are stout and strongly chitinized, spoon-shaped organs, which can be compared to none of the known gonopods of Spirobolids.

Another Indian species *A. murrayi*, originally ascribed to *Acanthiulus*[17] has later on been made the type of a third genus, *Polybunolobus*, by Pocock.[18] To this Pocock was led by Daday's statement that, in *Acanthiulus*, the pores open in the metazonite ; since this statement proves to be erroneous (as will by seen hereafter), the validity of Pocock's genus has to be tested anew, and this will only be possible when the male of *A. murrayi* is known.

ACANTHIULUS BLAINVILLEI, Le Guillou, 1841.

(Plate xv., figs. 23-26).

Julus Blainvillei, Le Guillou, Bull. Soc. Philom. Paris, 1841, p. 80; Gervais in Walckenaer, Hist. Nat. Ins. Apteres, iv., 1847.

Crigoniulus Blainvillei, Silvestri, Ann. Mus. Civ. Stor. Nat. Genova, xxxiv., 1894, p. 95.

Spirobolus dentatus, Daday, *Loc. cit.*, 1893.

Acanthiulus Blainvillei, Gervais, *Loc. cit.*, 1844 ; Bollman, Bull. U.S. Nat. Mus. No. 46, 1893 ; Pocock, *Loc. cit.*, 1893 and 1903 ; Brölemann, *Loc. cit.*, 1903.

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[17] Pocock—Ann. Mag. Nat. Hist. (6), xi., 1893, p. 136.

[18] Pocock—1893, *Loc, cit.*, p. 531.

♂ mat. : length 125 m/m ; diameter 10.50 m/m ; 50 segments ; one segment apodous ; 91 pair of legs.

♂ juv. : length 95 m/m ; diameter 9.30 m/m ; 50 segments ; one segment apodous ; 91 pair of legs.

♂ juv. : length 77 m/m : diameter 7.40 m/m ; 50 segments ; four segments apodous ; 85 pair of legs.

The more striking characters of this species have already been recorded by Gervais (*Loc. cit.*, p. 70) and, more recently by Daday (*Loc. cit.*, p. 101) to whom we are indebted for the following diagnosis :—

" Mediocris, postice parum attenuatus ; colore nigrescenti,
" nitidens ; antennis collum parum superantibus, flavidis; facie
" rugoso, sulco mediano levi ; clypeo utrinque foveis duabus ;
" oculis e seriebus 6 ocellorum utrinque 38-40 compositis,
" ocellis evanescentibus ; collo margine inferiore angustata,
" postice producto angusteque rotundato, sulco marginali unico;
" segmentis 49, excepto collo segmentoque ultimo, in margine
" postica rugosis, dentibusque 8 validiusculis coronatis; dentibus
" in superficie corporis tota in seriebus longitudinalibus 8
" ordinatis ; scobinis nullis ; segmento ultimo in processu
" deplanato, parum producto, valvulas anales non superanti
" exeunte ; valvulis analibus compressis, late carinatis, carinis
" ferrugineo-nigrescentibus vel nigris ; foraminibus repugna-
" toriis supra lineam medianam longitudinalem in annulo *tertio*
" segmentorum positis ; pedibus 91 paribus, ferrugineo-
" nigrescentibus, articulo tarsali spinis 4-5 validiusculis
" armato ; gnathochilario organisque copulatoriis in figuris 1,
" 6 et 7 Tabulæ III delineatis. Longit. corp. 145-150 m/m,
" latit. maxim. 11-12 m/m. Patria : Nova Guinea (Wilhelms-
" land)."[19]

In the mature specimen examined, the head is smooth, shining ; the labral dimples are small, the two median dimples stand nearer to one another than to the outer dimples. The mandibular pleuræ are angularly produced, without flat impressed surface.

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[19] The figures referred to in the description have not been found worthy of reproduction.

Space between the eyes once and a half the diameter of an eye; ocelli 50, in eight rows (9+9+8+7+6+5+4+2). Antennæ rather long, reaching the posterior margin of the first segment, slightly thickened distally; the three proximal joints naked, the following gradually more pilose. Last joint tipped with four sensory cones remote from one another. Micrometrical measurements of joints: 1st joint 0.946 m/m; 2nd, 1.849 m/m; 3rd, 1.376 m/m; 4th, 1,333 m/m; 5th, 1.247 m/m; 6th, 1.075 m/m; 7th and 8th, 0.172 m/m; total length 7.998 m/m. Diameter of 2nd joint 0.860 m/m; of 6th 0.989 m/m.

Anterior part of prozonite with concentric sulci; on the posterior part, the oblique striæ are very fine and their lower margin is raised into a tiny ridge. The metazonites are said to bear eight strong teeth, which is correct for the posterior half of the body; but, on the anterior half, the main ridges are less regular and may number ten on the first segments, and, further back, nine (in this case, the odd ridge stands on the median dorsal line). Between the main ridges, minor irregular ridges are to be seen, very conspicuous on segments two to five and gradually decreasing backwards. Sutural sulcus obsolete dorsally, distinct below the pores though not strongly marked. The space immediately in front of the suture, in the dorsal region, is coarsely punctured; it is widely depressed so as to give rise, on the prozonite, to an abrupt ridge; this was mistaken by Daday for the suture and led him to erroneously state that the pores open in the metazonite. Pores beginning on the sixth segment, standing high in the sides, very small, pierced in the middle of a somewhat raised spot, in front of the suture.

The produced marginal angle of the last segment conceals the upper angles of the valves, but does not exceed the level of their outer margins; it is somewhat compressed laterally, slightly raised and separated from the rest of the segment by a deep wrinkle. Anal sternite very wide and very short, with almost straight posterior margin.

On all legs, the coxæ are slightly produced and rounded, the following two joints are compressed laterally and ridged below. Tarsi padded. Joints, except the last, with but one distal bristle below.

Copulatory appendages:—Anterior gonopods (Pl. xv., figs., 23, 24), with ventral plate slightly expanded proximad, sinuate above and ending in two diverging, blunt horns; its lateral expansions *(r.)* are curled back around the base of the organ and meet the tracheal stalk *(ts.)* in a line on the posterior surface. Coxofemoral plate *(cf.)* almost entirely exposed, as long as the ventral plate, ending in a widely rounded angle. Tibial plate *(T.)* irregularly circular or triangular, entirely lodged in the posterior excavation of the coxofemur; distal inner angle thickened and folded backwards; its proximal inner angle shows a sub-triangular, translucent, shrivelled-surfaced field, the meaning of which could not be ascertained.

Posterior gonopods (Pl. xv., figs. 25, 26), two-jointed. Proximal joint with its proximal and inner edges thickened and strongly chitinized, borne on an elongate and slender, distally widening tracheal stalk. Distal joint strongly chitinized; its sides are folded inwards, the inner surface being deeply excavated, wherefrom the joint gains its resemblance to a spoon. The hollowed surface is lined with membrane, forming an undulated crest in which opens the distal end of the seminal duct. The proximal end of the latter is swollen, bladder-like *(bl.)* and strongly twisted immediately above the swelling, where it crosses over from the proximal to the distal joint of the apparatus.

Three male specimens from New Guinea.

Genus Spirostrophus, *Sauss. and Zehntn.*, 1902.

Saussure and Zehntner[20] have deemed it necessary to create a sub-genus of *Trigoniulus*, termed *Spirostrophus*, for the reception of two species. A generic value has since been assigned to it by Attems.[21]

Spirostrophus differs from *Trigoniulus* in having the tarsi of the male not padded and the coxæ of the third to fifth pair provided with processes. The Australian species has, therefore, to be ascribed to the former genus. Yet *Spirostrophus* seems to lack the necessary homogeneity, as, in one of the species mentioned by the said authors, *S. rubripes*, the seminal duct of the posterior gonopds is said to end in a pseudo-flagellum, which is wanting in *S. naresi*, the type specimen. Moreover, it is still uncertain if the characters chosen to distinguish the said genus are of positive generic value. Nevertheless, it seems highly probable that the known Australian Trigoniulids have to be isolated from *Trigoniulus* in a distinct genus, the characters of which have still to be tested.

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[20] Saussure and Zehntner—In Grandidier, Hist. Phys. Nat. et Polit. Madagascar, 1897-1902.

[21] Attems—Myriopoden in Voeltzkow, Reise in Ostafrika, 1903-1905, 1910, p. 91.

SPIROSTROPHUS DIGITULUS, *sp. nov.*

(Plate xv., figs. 27-29; Plate xvi., figs. 30-32; with Figs. 28, 29).

♂ mat.: length 55 m/m; diameter 3.70 m/m; 50 segments; one segment apodous; 91 pair of legs.

♂ mat.: length 56 m/m; diameter 3.80 m/m; 54 segments; one segment apodous; 99 pair of legs.

♀ mat.: length 56 m/m; diameter 4 m/m; 52 segments; one segment apodous; 95 pair of legs.

♀ mat.: length 55 m/m; diameter 4 m/m; 53 segments; one segment apodous; 97 pair of legs.

Four specimens from Fraser Island, Queensland.

♀ mat.: length 69 m/m; diameter 4.40 m/m; 54 segments; one segment apodous; 103 pair of legs.

♀ mat.; length 66 m/m; diameter 4.40 m/m; 55 segments; one segment apodous; 105 pair of legs.

Two specimens from Condamine, Queensland.

Colour, a dark blackish-brown; the anterior part of prozonite (as far as exposed when the animal is curled up) ochre-yellow; the posterior margin-orange red. Legs and antennæ orange-yellow.

Head, smooth and shining, leathery along the posterior margin. Labral dimples four. Median sulcus thin in front, faint backwards, obsolete between the antennæ. Eyes rounded, divided by a space not twice the diameter of an eye; ocelli small, flattened yet distinct, arranged in seven to eight more or less curved series, from 5, 7, 8, 7, 6, 5, 2 = 40 to 8, 8, 8, 7, 6, 5, 3 = 45. Antennæ short, scarcely reaching beyond the middle of the first segments. The four proximal joints almost naked; fifth with but few distal setæ; sixth more pilose; last joint with fleecy hairs and four sensory cones. Micrometrical measurements of joints: 1st joint 0.416 m/m; 2nd, 0.640 m/m; 3rd, 0.480 m/m; 4th, 0.480 m/m; 5th, 0.480 m/m; 6th, 0.608 m/m; 7th and 8th, 0.032 m/m; total length, 3.136 m/m. Diameter of 2nd joint 0.384 m/m; of 6th, 0.480 m/m.

First segment almost leathery. Sides reaching as far down as the second segment, narrowed and angular with blunt apex; the anterior margin excised and margined below the eyes, marginal sulcus well marked. The five following segments with ventral surface depressed and roughly striate. Anterior part of prozonite smooth or with hardly distinct concentric striæ. On a few anterior segments, the posterior part of the prozonite shows transverse striæ which, on a level with and below the pores, are bent backwards and encroach on the metazonite. Further back (Pl. xvi., fig. 30) the transverse dorsal striæ disappear, the prozonite being widely strewn with delicate horse-shoe-shaped punctures, always larger along the suture; traces of the striæ remain below the pores and venter; complete longitudinal striæ are only seen low down above the legs. Metazonite densely covered with minute longitudinal striæ, less distinct backwards. Suture indistinct between the pores, impressed and more or less clearly sulcate in the sides and venter. Pores start on the sixth segment; they are located high in the sides and on the prozonite; a longitudinal sulcus is seen on the metazonite in connection with the pore.

Last segment leathery, its posterior margin angularly produced, the angle being wide open and not concealing the upper angles of the valves. The latter are moderately prominent, rather globular at the base, slightly impressed; margins not thickened and without trace of marginal sulcus. Anal sternite wide and very short, with almost straight transverse posterior margin. Sterna of the other segments striate, more strongly in the middle. Stigmata small.

Legs shortish, with but one distal bristle below on the five proximal joints.

Male:—Legs of the first and second pair swollen. Coxæ of the 3rd and 4th pair with a strongly developed, distally rounded, spatulate (3rd pair, Pl. xxi., fig. 31) or bead-like, (4th pair, Pl. xvi., fig. 32) process; 2nd and 3rd joint of the following legs longitudinally grooved below. Tarsi not padded. Seventh segment swollen ventrad, but without raised margin.

Copulatory appendages (Pl. xv., figs 27, 28) :—The ventral plate of the anterior gonopods *(V.)* appears on the anterior surface, as a transverse arched band, the ends of which are curled back and expand around the basis of the posterior surface of the organ ; the centre of the band is produced into a narrow, almost parallel sided plate, with moderately swollen base, tipped with a sub-triangular piece, the angles of which are rounded ; on the posterior surface the ends of the band meet the tracheal stalk *(ts.)* which are angularly directed upwards and inwards ; the tracheal stalks are bent at right angles, not unlike a pickaxe, their upper angles leaning against the inner angle of the femur as well as against the middle of the base of the tibia. The distal process of the coxa is slender, digitiform, somewhat longer than the ventral plate ; no endoskeletic process exists proximally. The femur *(Fem.)* is a broad, triangular, globular plate, sitting partly on the curled expansion of the ventral plate, partly on the outer branch of the tracheal stalk ; its outer edge is fused as usual with the coxal expansion ; its distal edge is emarginate. The tibia *(T.)* is a conspicuously developed triangular piece, the base of which is very broad ; it articulates with the distal edge of the femur on its outer half only, the inner half remaining free. The distal plate of the tibia is considerably enlarged so as to conceal the largest part of the tibia ; it extends far beyond the ventral plate and the coxal process ; its outer margin is sinute and its apex rounded.

Posterior gonopods (Pl. xv., fig. 29) composed of two joints placed at right angles. The basal joints of both gonopods are connected by an elastic bridge, the rigid ends of which hem inwardly the basal joints of the gonopods and meet the long and slender tracheal stalk. The basal joint shelters the usual bladder-like swelling *(Cl.)* of the seminal duct and its strongly twisted proximal part. The distal joint is elongate and constricted in the middle, where traces of an articulation may be seen along the outer edge *(x.)* ; the proximal half is gradually tapering from the base, and shows a rounded swelling along its inner edge ; the distal half is formed of two parallel lamellæ the shape of which will be seen in Pl. xv., fig. 29.

It is not easy to decide if the present species is distinct from *Trigoniulus burnetticus*, Attems,[22] as nothing is known of the sexual characters of the latter form, the type of which is a female. Attems' species seems to be larger.

Also *Trigoniulus comma*, Attems,[23] is only known from a female specimen; but the diameter is considerably larger and the description of the integuments do not correspond with those of *S. digitulus*.

S. digitulus probably bears much resemblance to *Trigoniulus targionii*, Silvestri, but may be readily distinguished by the presence on the prozonite, of the horse-shoe-shaped punctures, and by the shape of the first pair of copulatory appendages.

Silvestri's description is as follows[24]:—

" *Trigoniulus targionii*, sp. n. ♀ Color fusco-rufus, margine " postico somitorum, capite, antennis pedibusque rufo-pallidis. " Caput laevigatum, medium sulco in facie interrupto, circa " labrum poris 2 + 2. Oculi subcirculares ocellis c. 20 sat " distinctis. Antennae articulo sexto longiore et crassiore, " collum non superantes. Somita: collum lateribus angustatis " antice emarginatis, postice fere recte truncatis; somita " coetera tota laevigata sub poris tantum ante suturam striis " nonnullis. Pori permagni. Somitum anale cauda vix " angulata valvulas anales non superante, valvulis immarginatis, " sternito lato triangulari. Pedes sat breves. ♂ Pedes 1-2 " paris incrassati, infra spinosi; pedes paris 3-4 articulo primo " processu magno interne recte truncato, externe rotundato " acuto, pedes paris 5 articulo primo processu parvo instructo. " Organum copulativum (fig. 28) lamina ventrali lamina antica " vix longiore, lamina postica magis breviore apica triangulari " par internum (fig. 29). Somitorum numerus 52. Long. corp. " m/m 70; lat. corp. m/m 6. Hab. Cairns (Queensland)."

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[22] Attems—In Semon, Zool. Forschungsreisen in Australien, 1898 p. 513.

[23] Attems—*Loc. cit.*, p. 513.

[24] Silvestri—Bull. Soc. Entom. Ital., xxix., 1897, p. 229.

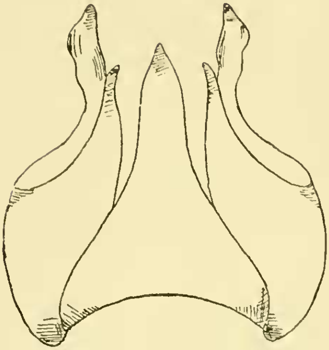

Fig. 28.

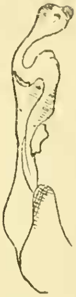

Fig. 29.

Genus Spirobolellus, *Pocock*, 1894.

Pocock, 1894; Silvestri, 1895. Nec. Brölemann, 1902 = *Epitrigoniulus*; nec Attems, 1907, 1910 = *Pseudospirobolellus*; nec Pocock, 1898, Biol. Centr. Amer.

This generic division was proposed by Pocock in 1894,[25] with the following diagnosis :—

" Eyes large, sub-circular, widely separated. Antennæ
" short, 1st segment as large as the 2nd (? always). Frontal
" sulcus weak. Labral pores 4 + 4. Collum large, extend-
" ing laterally as low as the second. The transverse sulcus
" obsolete at least dorsally, its place taken by a groove which
" is sinuated in front of the pore and gives the appearance
" described as the pore being situated behind the sulcus ; the
" area behind the groove elevated. Sterna striate. Scobina
" absent (? always). Last segment of the legs not padded in
" the male. Type *S. chrysodirus*, nov."

Seven species were listed herein, but no description of copulatory appendages was given. Four more species were added by Prof. Silvestri,[26] in 1895 without any mention of sexual characters. Reference was made by the author[27] and by

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[25] Pocock—In Weber, Reise in Niederländish Ost-Indien, 1894, p. 398.

[26] Silvestri—Ann. Mus. Civ. Stor. Nat. Genova (2), xiv., pp. 758-760.

[27] Brölemann—Zool. Anz., xxvi., 1902, No. 691, p. 180.

Attems[28] and Woeltzkow[29] but both references proved to be erroneous. Brölemann's *S. cruentatus* became the type species of *Epitrigoniulus*, and Attems' *S. bulbiferus* was made the representative of a new genus, *Pseudospirobolellus*, by Carl.[30]

Carl adds to our knowledge of *Spirobolellus*, particularly by means of excellent figures[31] the general features of which correspond with the copulatory appendages of the New South Wales species described hereafter. The examination of the latter affords the following complimentary details:—

Primary characters:—Copulatory appendages (Pl. xvi., figs. 35-38). Tracheal stalk *(ts.)* of anterior gonopods directed inwards, as in *Rhinocricus*. Coxæ produced proximally into long and slender endoskeletic rods *(esk.)*. Femur not covering any portion of the posterior surface of the organ; when the latter is viewed from the posterior surface, the femur is seen as a narrow external pad *(Fem.)*; its posterior, concave surface is almost entirely concealed by the tibia *(T.)*, which realises a development unrecorded in any other genus, being in contact proximally with the tracheal stalk, whilst its apex reaches or overreaches the summit of all the other parts of the organ.

Posterior gonopods entirely independent, somewhat similar to those of *Pseudospirobolellus*, but comparatively wider, compressed, poorly chitinized, with a short inner process; coxal joint not distinct. The seminal duct exists, being an open groove (Pl. xvi., *d.*, fig. 38) provided distally with an open, oval, bladder-like swelling *(bl.)*, the largest diameter of which is transverse; the duct is bent at a right angle, immediately above the swelling, but is not twisted, and opens distally at the root of the inner process. The ventral plate of posterior gonopods could not be traced.

Secondary characters:—First and second pair of ambulatory legs of male incrassate but without special features; coxæ of the following pairs, up to the seventh, more or less produced (Pl. xvi., fig. 34); tarsi not padded. Antennæ tipped with four sensory cones. Cap of gnathochilarium with its median plate rounded backwards (not forked). Second joint of mandibula with its dorsal expansion almost loose. The remainder as in Pocock's diagnosis.

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[28] Attems—Mitteil. naturf. Mus. Hamburg, xxiv., 1907, p. 131.

[29] Woeltzkow—Reise in Ost-Afrika, iii., 1910, p. 92.

[30] Carl—Revue Suisse Zool., xx., 1912, p. 167.

[31] Carl—*Loc. cit.*, figs. 25 to 27.

In this genus, the copulatory appendages show a quite unusual structure. Most striking are the presence of the proximal endoskeletic process of the coxæ of anterior gonopods, and the growth of the tibia. Such features agree with no other genus, except perhaps *Paraspirobolus*.

The description of the latter genus[32] is evidently erroneous and imperfect; erroneous, while the coxæ of anterior gonopods have undoubtedly been mistaken for the posterior gonopods, owing to the resemblance of their endoskeletic process with a tracheal stalk; imperfect, while the posterior gonopods have been overlooked. Yet it is not likely that both genera should be synonymical, as *Paraspirobolus* is said to possess only 2 + 2 labral dimples (instead of 4 + 4) and as the tibia appears to be larger still than in *Spirobolellus*.

Turning to Pocock's genus, it is to be mentioned that a seminal duct and a bladder exist in the posterior gonopods, but these are different from the similar organs of *Trigoniulus*, for instance, in being simply open grooves. It is by no means surprising that they should have escaped Carl's attention as they are scarcely more chitinized than the gonopods themselves, and could only be detected by using oblique light.

SPIROBOLELLUS RAINBOWI, *sp. nov.*

(Plate xvi., figs. 33-38).

(a) ♂ mat.: length 40 m/m; diameter 3.50 m/m; 44 segments; three segments apodous; 75 pair of legs.

(b) ♀ mat.: length 51 m/m; diameter 4.50 m/m; 44 segments; one segment apodous; 81 pair of legs.

(c) ♀ mat.; length 43 m/m; diameter 4.30 m/m; 47 segments; two segments apodous; 85 pair of legs.

(d) ♀ mat.: length ?; diameter 4.50 m/m; 45 segments; two segments apodous; 81 pair of legs.

(e) ♀ mat.: length 42 m/m; diameter 4 m/m; 44 segments; two segments apodous; 79 pair of legs.

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[32] Brölemann—Rev. Mus. Paulista, v., 1901, p. 183.

Black, with a narrow yellow margin around the first tergum and along the posterior edge of each segment, and with a yellow transverse band across the anal valves, the upper and the lower angles of the valves remaining of the dark ground colour.[33] Legs blackish brown.

Head smooth and shining even on the upper lip, which bears eight setiferous dimples; of these, the two median and the two external stand more closely together. The median sulcus is distinct on the upper lip, but soon dies out before reaching the level of the antennæ, and is scarcely recognisable on the top of the head. Eyes standing wide apart, the space being about two and a half to three times the largest diameter of an eye. Ocelli congregated on a sub-triangular field, nineteen to twenty-seven in number (5 + 6 + 5 + 3 = 7 + 8 + 6 + 4 + 2). Antennal fossæ shallow, the outer margin of the head being but feebly swollen. Antennæ very short, not reaching the posterior margin of first tergite; the three proximal joints almost naked, the distal joints more and more densely clothed with short setæ. Some minute sensory rods exist along the upper distal margin; four sensory cones at the end. Micrometrical measurements of joints: 1st joint 0.344 m/m; 2nd, 0.387 m/m; 3rd, 0.301 m/m; 4th, 0.258 m/m; 5th, 0.344 m/m; 6th, 0.387 m/m; 7th and 8th, 0.107 m/m; total length, 2.128 m/m. Diameter of 2nd joint, 0.322 m/m; of 6th, 0.365 m/m.

First tergite nearly smooth, moderately shining; its sides somewhat produced, perpendicular, slightly narrowed and rounded laterally, with a pre-marginal sulcus along the anterior and the lateral margins; no transverse sulci.

Following segments rather less shining, though lacking distinct sculpture. The dorsal part is entirely destitute of transverse suture; it may scarcely be said to be depressed below the pores, where, sometimes (on dried specimens), a shadowy gray line is to be witnessed dividing the pro- from the metazonite. Dorsally, the former is adorned with dainty horse-shoe-shaped punctures opened backwards (Pl. xvi., fig. 33); these grow larger sideways and, below the pores, transform into irregularly arched, oblique striæ which gradually encroach upon the metazonite and even cross it entirely on the ventral surface. The metazonite is smooth dorsally. Pores very small, beginning on the sixth zonite and located in contact with and behind what has to be considered as the transverse suture. No longitudinal sulcus is seen on a level with the pore.

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[33] This band is missing in one of the female specimens.

Last segment with posterior margin feebly produced, cut into a short and very wide angle, the rounded apex of which covers the dorsal angles of the valves, though falling short of the level of their posterior margins. Valves protruded, rather flattened, naked and smooth; margins not compressed and destitute of any pre-marginal sulcus, joining so as to give rise to a distinct, sharp groove. Anal sternite with straight, transverse posterior margin. Sterna of other segments covered with fine, dense transverse wrinkles. Stigmata sub-triangular, small.

Legs short, with one ventral bristle on each joint, except the last, which bears two; claw long, slender, acute, curved in the anterior legs.

Male:—Legs of first and second pair incrassate, but without any special particulars. Coxæ of the legs three to seven tipped with a feebly developed, thick, square protuberance (Pl. xvi., fig. 34). Tarsi not padded.

Copulatory appendages:—Anterior gonopods (Pl. xvi., figs. 35, 36): ventral plate *(V.)* triangular, with upraised, sinuate lateral margins and a notched summit. Tracheal stalk *(ts.)* long and slender. Coxa angularly produced distad beyond the end of the ventral plate, and ending proximally in a long endoskeletic rod *(esk.)*, as long as the tracheal stalk and of a similar appearance. Femora *(Fem.)* fused, as usual with the coxa along its entire inner margin, concealed on the posterior surface by the tibia *(T.)* which reaches as far down as the root of the tracheal stalk and notably exceeds distally the apex of the coxal expansion.

Posterior gonopods (Pl. xvi., figs. 37, 38) entirely independent, blade-like, slightly arched, with traces of articulation *(x.)* beyond its distal two-thirds, along the outer margin. The inner margin is lamellar with three tooth-like processes; one of them *(a.)* stands about in the middle of the concavity, the second *(b.)* opposite the trace of of articulation and the third *(c.)* more triangular, beyond the second. Seminal groove *(d.)* short, provided proximally with an oval bladder *(bl.)*, the long axis of which is transverse; immediately beyond the bladder, the groove is angularly crooked and directed towards the base of the first inner process. Being rather shallow, this groove is difficult to observe. Tracheal stalk long, slender, curved near its end.

One male and four female specimens from Mount Sassafras, Shoalhaven.

Genus Dinematocricus, *gen. nov.*

Primary characters:—Gonopods as in *Rhinocricus*, with the difference that the distal joint of the posterior pair ends in one or two, more or less flagelliform, always gradually tapering processes (Pl. xvii., fig. 55; Pl. xviii., figs. 63, 69).

Secondary characters:—Labral setiferous dimples 2 + 2. Mentum not divided. Antennæ usualy short. First somite with rounded sides, falling short of the second somite. Scobina present or missing. Pores located in the prozonite, close to the transverse suture, which is more or less marked and may fail entirely. Last tergite generally not overreaching the upper angles of the anal valves. Sterna transversly striate. Stigmata small. Legs short, usually destitute of setæ except near their distal ends; usually padded in the male.

Type species—*Dinematocricus lanceolatus*, sp. nov.

The representatives of this genus are very numerous; they have hitherto been listed amongst the *Rhinocrici*, with which they have, indeed, the most striking resemblance. It has been found necessary to separate them generically on account of the primary character recorded above. Whereas, in *Rhinocricus*, the outer branch of the posterior gonopod gradually grows wider distally, being truncate at the apex, with more or less acute angles, in *Dinematocricus*, this same branch is gradully tapering from the base, flagelliform or, very seldom (only three aberrant cases known), digitiform. Moreover, the seminal duct seems to have a peculiar structure; in *Rhinocrici*, it is known to be located in the inner branch, along the edge facing the outer branch, and to be a groove the lips of which are scarcely developed and pressed tight one against the other; a section cut through the branch shows the duct to be circular. In *Dinematocricus*, the duct is similarly located, but its lips are larger, more lamellar and appear less tightly fitted together

(*D. holosericeus*, *D. lanceolatus*, Pl. xviii., fig. 64); or even the branch seems to be ribbon-shaped on its whole length (*D. falcatus*, *D. carinatus*). It has not been found appropriate to make use of these structures until their constancy shall have been verified on some larger material; they are mentioned here in order to draw the attention of specialists to this interesting point.

As far as can be understood from the descriptions issued by preceding authors, the species belonging to *Dinematocricus* are prevalent in the islands east of the Sunda Archipelago. Most of the *Rhinocrici* of the Celebes Islands recently described by Dr. Carl (1912) undoubtedly belong to the new genus; many more are known to inhabit the Moluccan Archipelago, the Kei and Aru Islands, the Australian continent and to reach as far east as Fiji; a single species, so far as known, is recorded from America, viz., *Rhinocricus caudatus*, Newport; and even this has to be held as an aberrant form, on account of its pre-anal segment being provided with a conspicuous spiniform process.

It has been found necessary to divide the new genus into three sub-genera, according to the presence or absence of the inner branch of the posterior gonopods, and to its position.

The sub-genus *Dinematocricus, sensu stricto*, will include such species in which the distal joint of the posterior gonopods is divided into two flagelliform (or at least gradually tapering) branches, the distance between the proximal swelling of the joint and the root of the inner branch being about equal to the length of the latter.

The sub-genus *Cladiscocricus* will be represented by the sole type species *D. (C.) falcatus*, in which the inner branch of the distal joint of posterior gonopods starts immediately above the proximal swelling.

The third sub-genus, *Acladocricus*, which might perhaps as well be given generic value, will be made to contain species similar to *R. pyrrholoma*, Attems (chosen as type), of which the posterior gonopods are composed of a single flagelliform branch, the inner branch missing. No further reference will be made to this third sub-genus, of which no representative was found in the collection of the Australian Museum. It would be highly interesting to know where, in such case, ends the seminal duct, to which no author has ever alluded. The great majority of the species of *Acladocricus* inhabit the Celebes Archipelago.

In order to avoid repetition in exposing, after each description, the relationship of the new species with the forms already known, the species have been divided into four groups, according to regions, and an attempt has been made to tabulate them. Thus the tables are four in number, corresponding to the following areas:—I., Continental Australia; II., New Guinea; III., Bismarck Archipelago (including New Britain and New Ireland) to the Solomon Islands; IV., Fiji. The tables will be found at the end of the present memoir.

DINEMATOCRICUS (Cladiscocricus) FALCATUS (Silvestri, 1897).

(Plate xvi., figs. 29-44; with Figs. 30, 31).

Rhinocricus falcatus, Silvestri, 1897, Abh. Ber. K. Zool. Mus. Dresden, 1896-1897, vi., No. 9, p. 6.

Prof. Silvestri's description runs thus:—

"♂: Color brunneo-rufescens totus. Caput totum laeviga-
"tum. Antennæ ? Oculi subcirculares, ocellis distinctis c.
"40. Somita: collum lateribus sat angustatis, rotundatis;
"somita coetera tota laevia, subtus tantum striis nonnullis.
"Scobina in somitis 9-ad penultima. Somitum praeanale cauda
"acuta, valvula anales vix vix superante. Somitum anale
"valvulis parum compressis, sternito triangulari, apice acuto.
"Pedes paris 3-5 articulo primo processu sat longo et lato aucto.
"Organum copulativum: par anticum (fig. 30) lamina antica
"minore longitudine quam illa laterum, apice minus attenuato,
"par internum (fig. 31) processu longo falciformi constituto,
"ad basim processu parvo acuto auctum. Somitotum numerus
"53. Long. corp. mm. 67; lat. corp. mm. 7. Hab. Nova
"Hollandia: Gayndah."

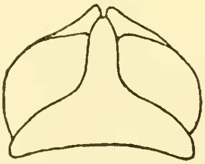

Fig. 30.

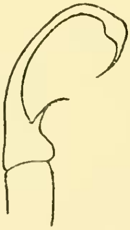

Fig. 31.

On account of some differences mentioned hereafter, the Gayndah specimens have been considered as a distinct subspecies, for which the name of *scobinula* sub-sp. nov. is proposed.

(a) ♂ mat.: length 70 m/m; diameter 6.50 m/m; 56 segments; one segment apodous; 103 pair of legs.

(b) ♀ mat.: length 77 m/m; diameter 7.50 m/m; 55 segments; one segment apodous; 103 pair of legs.

Gayndah, Queensland.

Chestnut, with darker metazonite. Legs and antennæ chestnut.

Head smooth, shining, with four subequidistant labral dimples; median sulcus almost obsolete. Eyes rounded, divided by two-and-a-half times the diameter of one of them; ocelli small, distinct, arranged in 6-7 series to $9+10+9+8+8+5 = 49$ to $9+9+9+9+8+5+1 = 50$. Antennæ very short, reaching the middle of the following segment, wide apart, the distance between the sockets (2.50 m/m) equal to more than the length of the four proximal joints. The three basal joints almost naked, the following gradually more pilose; four sensory cones. Micrometrical measurements of the joints: 1st joint 0.602 m/m; 2nd, 0.688 m/m; 3rd, 0.559 m/m; 4th, 0.559 m/m; 5th, 0.516 m/m; 6th, 0.473 m/m; 7th and 8th, 0.086 m/m; total length 3.483 m/m. Diameter of 2nd joint 0.537 m/m; of 6th, 0.516 m/m.

Mandibular stem of male with the anterior angle acute, directed downwards.

First segment falling a good way short of the ventral surface of the second; surface almost smooth dorsally, less so on the sides; anterior margin straight, sides rounded or with a faint trace of a rounded angle. Marginal sulcus moderately long, scarcely reaching the inferior level of the corresponding eye. Second segment flattened and sulcate on the ventral surface, the sides of which are rounded, or even somewhat swollen.

Scobina from about the ninth to about the twenty-second segment very small, the first and the fourth to fifth last are dot-like; it is (accidentally ?) missing on the seventeenth segment. The distance between the dimples equal to about eight times the diameter of one of them. Dimples sub-circular, with smooth bottom; the striate area scarcely as long as the dimple, rounded, with very few striæ.

Anterior zone of the prozonite partly covered with irregular transverse striæ; posterior zone strewn with extremely fine, somewhat elongate punctures: metazonite still less distinctly sculptured, yet bearing along the suture some more strongly marked punctures; a few deep punctures also stand in front of the suture. Sutural sulcus almost obsolete dorsally, distinct elsewhere, crossed, on a level with the pore, by a longitudinal sulcus more shallow on the pro- than on the metazonite. Pores starting on the sixth segment, small, located high up in the sides, near the suture and below the above-mentioned longitudinal sulcus. The usual oblique and longitudinal sulci are only to be seen low down in the sides and above the legs, lower still in the posterior half than in the anterior half of the body.

Posterior margin of last segment produced into a very short conic, acute process just reaching over the superior angles of the valves. The latter are not prominent, moderately globular, scarcely depressed, with rounded margins and without any trace of pre-marginal sulcus. Anal sternite triangular, its length about two fifths of its breadth at the base; sides straight, apex cut at a right angle. Sternites of the other segments transversely sulcate. Stigmata small.

Legs short (about 3.50 m m), but with one distal bristle below on the five proximal joints.

Male:—Anterior pair of legs thickened but without tarsal pads. Second joint of the second pair showing inwardly a flattened surface giving rise to a sharp posterior edge. Coxæ of the third, fourth and fifth pair tipped with a long, but gradually decreasing digitiform process (Pl. xvi., fig. 39), the end of which is more or less rounded; besides, the second joint of the same legs is more or less warted below. Ventral margin of the seventh segment produced into a transverse thickened edge, notched mesially in front.

Copulatory appendages:—Anterior gonopods (Pl. xvi., figs. 40, 41); basal part of the ventral plate roughly hexagonal; proximal margin straight, angles cut off diagonaly, anterior-lateral sides straight. The distal part is a linguiform process, longer than the base, gradually narrowed, with straight sides and rounded end. The coxal expansions *(cox.)* remain completely exposed; they are cut off at right angles distally and fall short of the summit of the ventral plate. Proximal endoskeletic process *(esk.)* long, spatulate. Femur *(Fem.)* wide; tibia *(T.)* in a line with the femur, short, conic, with a transverse undulate fold in the middle of the posterior surface (*a*, Pl. xvi., fig. 41), and a sub-quadrangular apical plate with rounded angles, about half as long as the stem of the tibia; the apical plates reach with all their length beyond the apex of the ventral plate. Posterior basal plate *(c. 2.)* very narrow, linguiform, twice as long as broad, with rounded apex.

Posterior gonopods (Pl. xvi., fig. 42) two-jointed. Proximal joint comparatively long; tracheal stalk long and slender. Second joint arched, oval in section in its basal two thirds, lamellar distally, the lamellar part being scarcely enlarged proximad and gradually tapering endwards. A short, straight, acute, inner branch is seen to start immediately above the rounded expansion of the base of the joint. The seminal duct seems to end at the root of the inner branch.

The female specimen shows scobinas from the ninth to the twenty-fourth zonite; the dimples are as wide apart as in the male, but the small dimples are a trifle more crescentic. The ocelli stand in five rows $(9+10+9+8+5=41)$ on one side and six rows $(9+9+9+8+6+5=46)$ on the other. The anal sternite is not as neatly triangular, the apex is rounded, as if worn off. Colour, chestnut as in the male.

One more female specimen exists in the Australian Museum, collected at the same locality, Gayndah, Queensland.

♀ mat.: length 72 m/m; diameter 7.50 m/m; 54 segments; one apodous; 101 pair of legs. It has a uniform greenish-black colour. The face is slightly wrinkled; the median sulcus is more distinct especially between the eyes where it is impressed. The eyes are composed of forty-five ocelli arranged in six rows $(9+9+9+8+6+4—9+9+9+8+73)$. Scobinas up to the twenty-fifth segment, punctiform as in the male. Anal sternite triangular (not worn out).

Prof. Silvestri states that his type possess scobinas from the ninth to the penultimate, which does not agree with the three specimens examined, and that the metazonites are smooth, no mention being made of punctures Moreover, slight differences can be found between Prof. Silvestri's figures of the copulatory appendages and ours; the sides of the ventral plate of anterior gonopods are less angularly excised, the apex is more pointed; the distal, lamellar end of the outer branch of posterior gonopods is somewhat differently shaped. There is, therefore, hardly any doubt that the Gayndah specimens belong at least to a sub-species different from the Cairns form.

DINEMATOCRICUS (? Cladiscocricus) CONSIMILIS, *sp. nov.*

(Plate xvi., fig. 45).

♀ mat.: length 62 m/m: diameter 8 m/m; 52 segments; one segment apodous; 97 pair of legs.

The only specimen to hand so closely resembles the females of *D. falcatus*, that it has been deemed sufficient to note the differences. No importance can be given to the colour and to the length recorded as the animal is contracted having only recently cast its skin when captured, as is evident by the fact that the integuments are still soft.

The anterior margin of first segment is slightly emarginate on a level with the eyes, and not as broadly rounded. The scobinas are entirely different from those of *D. falcatus*; the dimples assume the shape of a deep transverse sulcus, and the space between them is hardly equal to the breadth of one of them. The posterior sulcate field is indistinct as the sulci are continued by the concentric striæ of the surrounding integuments (11th segment). Or else the dimples are more crescentic, the distance between them is equal to about one-and-a-half diameter of one of them, and the striate field is distinct (Pl. xvi., fig. 45, 21st segment).

The exposed posterior half of the prozonites cannot be described as punctured; or rather the punctures are strongly intermingled with striæ. The spots, the pores are pierced in, appear somewhat raised. The posterior margin of the last segment is angularly produced, but cut at right angles and not emarginate on each side of the apex, so that no distinct process is to be seen.

Male unknown. A single female from Gayndah, Queensland.

DINEMATOCRICUS *(sensu stricto)* FAUCIUM, *sp. nov.*

(Plate xvi., fig. 46; Plate xvii., figs. 47, 48).

♂ mat.: length 112 m/m; diameter 9.50 m/m; 54 segments; one segment apodous; 99 pair of legs.

Dark blackish-brown, with an olivaceous shade, and a red-brown belt along the margins of the segments. Head blackish-brown, with brighter labrum. Last segment and valves bright brown red. Legs dark brown, with the proximal joints paler.

Head smooth, with two shallow indistinct impressions above the labrum and with minute transverse wrinkles or striæ, of which a pair more strongly marked is seen crossing the post-labral impressions. Four labral dimples. Median sulcus well marked on the labrum and on the back of the head, faint, thread-like, or even obsolete between the antennæ. Eyes sub-circular; the distance between them equal to twice the diameter of one of them. Ocelli distinct, though rather flattened, numbering about forty-one, arranged in six series (7+8+8+7+6+5 to 8+8+8+7+6+4). Antennal fossæ shallow; distance between the sockets equal to the length of the four proximal joints. Antennæ compressed as usual, extremely short, scarcely reaching beyond the middle of the first tergite; the four proximal joints bare, except a few distal setæ; fifth joint poorly beset with setæ, these being numerous on the last joint only. Four sensory cones. Micrometrical measurements of joints; 1st joint 0.832 m/m; 2nd, 1.024 m/m; 3rd, 0.928 m/m; 4th, 0.832 m/m; 5th, 0.832 m/m; 6th, 0.640 m/m; 7th and 8th, 0.128 m/m; total length, 5.216. Diameter of 2nd joint 0.800 m/m; of 6th, 0.704 m/m.

Scobinas from about the eighth to about the thirty-sixth segment. Distance between the dimples equal to about one-and-a-half diameter of one of them. The dimple (Pl. xvi., fig. 46) is formed by a deep, circular sulcus enclosing an oval, transverse, polished wart; it is lying near the anterior margin and is distinct from it; behind the dimple is a very narrow crescentic field, about half the length of the dimple, the surface of which is dull but shows no distinct striæ.

First tergite smooth, shortened laterally; sides irregularly rounded, the posterior margin being more convex than the anterior. Marginal sulcus very short and weak, running close to the margin. Ventral surface of second segment somewhat excavated, swollen on each side, with shallow sulci. Anterior concealed parts of prozonites covered with minute and dense striæ, yet shining; rest of the zonites punctured, more distinctly on the posterior part of the prozonite than on the metazonite, the punctures intermingled with faint longitudinal striæ. The latter are more numerous on the anterior six segments. The posterior parts of the prozonites show moreover irregular, wide and shallow wrinkles, two of which stand in front of the pores and are more deeply impressed. Distinct oblique and longitudinal striæ are to be found only far down below the pores. Transverse sutural sulcus completely obsolete on the back, scarcely visible above and below the pores as a tiny threadline.

Pores starting from the sixth segment, small, opening high in the sides, in the middle of a raised spot, wherefrom they appear to be margined. On a level with the pores is a very faint longitudinal sulcus, crossing the whole segment.

Last tergite with its posterior margin angularly produced; the process is feebly depressed at its base, and does not conceal the upper angles of the valves. Valves moderately prominent, scarcely globular, compressed in the vicinity of the margins, causing the latter to appear pad-shaped. Anal sternite rounded, very broad, its length equal to about one-fourth of the breadth, with a weak transverse sulcus near its base. Ventral plates of the other segments transversely sulcate: the sulci weak. Stigmata small.

Legs moderately short, rather slender, with but one ventral bristle on each joint except the last.

Male:—Femora of the second pair flattened inwardly, with gibbous posterior surfaces. Coxæ of third, four and fifth pair produced. Tarsi not padded.

Copulatory appendages (Pl. xviii., fig. 47, 48):—Ventral plate of anterior gonopods *(V.)* semi-circular, twice as wide as long, tipped with a digitiform, tapering process as long as the semicircular basis, with undulate sides and with apex not even half the breadth of its root. Distal angle of the coxal expansion scarcely reaching the middle of the process of the ventral plate, rounded. Tibia *(T.)* in a line with the femur *(Fem.)*, its stem only a little longer than wide; the distal plate almost circular, more than half the length of the stem, not reaching the summit of the ventral plate. Posterior basal plate *(r. 2.)* evenly rounded distally, with concave sides.

Posterior gonopods two-jointed; the distal joint ending in two flagelliform, gradually tapering processes, of which the inner is shorter than the outer. Tracheal stalk long and slender, curved distally.

Female unknown. One male specimen from Thursday Island.

DINEMATOCRICUS, *sp.*

♀ mat.: length 108 m/m; diameter 10.50 m/m; 51 segments; one segment apodous: 95 pair of legs.

The single female specimen known is closely related to the preceding species, from which it had to be separated on account of the following particulars:—The last tergite, the valves and all the joints are of the same dark olive brown colour as the body. A large dimple is to be seen on the forehead between the eyes.

The anal stergite is triangular, with a broad base and slightly emarginate lateral margins, the length being more than one-third of the breadth. A deep transverse sulcus exist near the base of the sternite.

This specimen could have been identified with *Spirobolus fenicheli*, Daday,[34] had not the author stated that his species has no scobinas.

New Guinea.

DINEMATOCRICUS ANALIS, *sp. nov.*

(Plate xvii., figs. 49-52.)

♂ mat.: length 102 m/m; diameter 8 m/m; 49 segments; one segment apodous; 89 pair of legs.

♀ mat.: length 114 m/m; diameter 9.50 m/m; 49 segments; one segment apodous; 91 pair of legs.

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[34] Daday—Term. Füzet., 1893, p. 102.

Dark olive brown, with the posterior margin of segments red-brown. Legs dark.

Head smooth, showing indistinct transverse wrinkles. Four labral pores. Two shallow impressions above the pores. Median sulcus weak, obsolete between the antennæ, where the head is rather flattened ; a small dimple may be accidentally found between the eyes, the sulcus breaking off suddenly in the dimple, and re-appearing frontwards. Eyes rounded ; the distance between them equal to about twice the diameter of an eye ; composed of distinct, though flattened ocelli numbering forty-seven to fifty, arranged in seven rows (7+8+8+8+7+6+3—9+9+9+8+7+5+3). Antennæ very short, not reaching the posterior margin of the first tergite ; the distance between the sockets equal to the length of more than four proximal joints ; the four basal joints bare, showing only a few apical setæ ; the setæ grow gradually more numerous on the last joints ; fifteen sensory cones at the end. Micrometrical measurements of joints : 1st joint 0.544 m/m ; 2nd, 0.736 m/m ; 3rd. 0.576 m/m ; 4th, 0.480 m/m ; 5th, 0.448 m/m ; 6th. 0.416 m/m ; 7th and 8th, 0.096 m/m ; total length, 3.296 m/m. Diameter of 2nd joint, 0.576 m/m ; of 6th, 0.512 m/m.

First tergite smooth along the posterior margin and covered with more or less distinct, minute striæ on the remaining surface ; the sides fall short of the following segment, and are somewhat irregular in shape ; the anterior margin is generally straight, and the posterior gently convex, the latter showing occasionally a faint notch ; the angle is more or less rounded, sometimes even truncate, both cases being liable to appear on the same specimen. The marginal sulcus is moderately impressed and located quite close to the margin.

Ventral surface of the second segment somewhat excavated, moderately swollen on each side.

Scobinas from the eighth to about the thirtieth or thirty-third segment. The dimple is reniform and very deep (Pl. xvii., fig. 51) ; the posterior field is more or less triangular, rather elongate and dull, though without distinct striæ.

Anterior, concealed part of the prozonite without concentric striæ, yet not smooth, showing under sufficient enlargement minute and short, irregular, transverse wrinkles or striæ. The posterior part of the prozonite and, still more, the metazonite may be said to be dorsally devoid of any sculpture, as the striæ and punctures of the integuments are nowhere distinct. Laterally the striæ are more easily detected; moreover, below the line of the pores, or lower down still appear the usual arched striæ of the prozonite: these are never strongly marked even above the legs. The suture is represented by a shallow concentric impression without any sulcus. Pores begin with the sixth segment; they are small; they open in front of the sutural impression in the middle of a low flattened wart: on a level with the pore a sulcus crosses the metazonite, but it is not to be traced on the prozonite.

Last tergite short, adorned with a few faint wrinkles: its posterior margin is angularly produced, yet is far from concealing the upper angles of the valves. Valves strongly prominent (Pl. xvii., fig. 52): their upper angles are quite unusually thickened and produced backwards; their surfaces are scarcely globular and show narrow pre-marginal impressions, causing the margins to appear wide and thick; in the female specimen, the margins are still more prominent and even irregularly nodulous. Anal sternite in shape of a semi-circle (♀? abnormal) or of a rounded triangle, in both cases much shorter than broad at the base. Sternites of the other segments with comparatively few striæ. Stigmata small.

Legs moderately short, with but one distal bristle below on each joint except the last.

Male:—Femora of the second pair flattened inwardly, somewhat tubercular posteriorly. Coxæ of the third pair produced as in *D. faucium*; joints, second and third much swollen below, fourth and fifth gradually less swollen. None of the tarsi padded.

Copulatory appendages (Pl. xvii., figs. 49, 50):—Ventral plate of the anterior gonopods *(V.)* with reniform basis, more than twice as broad as high, ending into a stout, conic process, as long as half the breadth of the basal part: its apex is truncate. Distal coxal expansion angular, yet broad and almost concealing the tibia, reaching as far as the summit of the ventral plate. Proximally, the coxa is produced into an endoskeletic process *(esk.)* reaching the middle of the tracheal stalk. Tibia *(T.)* in a line with the femur *(Fem.)*, nearly parallelsided, tipped with a sub-equilateral triangular piece. the length of which is about half the length of the tibial stem. Posterior basal plate *(r. 2.)* angular. Tracheal stalks slender, crooked.

Posterior gonopods of the usual form; distal joint ending in two flagelliform processes, of which the outer is not quite twice as long as the inner.

One male and one female from New Guinea.

DINEMATOCRICUS DISJUNCTUS, *sp. nov.*

(Plate xvii., figs. 53-57.)

♂ mat.: length 57 m/m; diameter 5 m/m; 54 segments: two segments apodous; 97 pair of legs.

Colour dull ochraceous with a slight olive shade; posterior margin of segments more chestnut; the line of pores on the last fourteen segments and the anal valves darkened. Head black. Legs chestnut.

Head smooth (or with tiny irregular wrinkles); four labral dimples; median sulcus distinct on the upper lip, very weak backwards, almost obsolete between the antennæ. Distance between the eyes equal to twice the diameter of an eye. Ocelli flattened, fairly distinct in the middle of the eye, but scarcely recognizable along the borders, numbering forty-five to forty-seven, arranged in irregular rows (1+5+6+7+3+7+5+5+6 or 1+3+5+5+6+7+7+7+6).

Antennal fossæ shallow. The distance between the antennal sockets equal to the length of the four proximal joints. Antennæ short, not reaching the posterior margin of the first tergite. The four proximal joints are almost bare; the setæ are rare on the fifth and more numerous on the last two joints. Four sensory cones. Micrometrical measurements of the joints:—1st joint 0.512 m/m; 2nd, 0.608 m/m; 3rd, 0.544 m/m; 4th, 0.512 m/m; 5th, 0.480 m/m; 6th, 0.416 m/m; 7th and 8th, 0.096 m/m; total length, 3.168 m/m. Diameter of 2nd joint 0.496 m/m; of 6th, 0.416 m/m.

First tergite smooth, shining. Its sides evenly rounded. Marginal sulcus very short, extending from the lower level of the eye to the middle of the curve of the sides.

Scobinas from about the fourteenth segment to about the thirtieth. The distance between the dimples is equal to almost four times the breadth of one of them. Dimple oval (Pl. xvii., fig. 56), distinct from the anterior margin of the zonite, though close to it. The posterior field is triangular, acute, dull, but not striate.

The integuments (Pl. xvii., fig. 57) are strewn with minute, longitudinal, widely spread striæ. The anterior concealed part of the prozonite, although not completely smooth, shows no distinct concentric sulci. The posterior part is adorned with arched oblique striæ; these grow gradually more perpendicular above the pores and turn into a transverse, dorsal, moderately impressed sulcus, as distant from the anterior smooth part as from the metazonite; this sulcus is interrupted dorsally on the segments two, three and four, and on a wider space on the second than on the other segments. Below the pores, the striæ assume a more and more longitudinal direction and gradually encroach on the metazonite. Immediately above the pore, the segment is crossed by a longitudinal sulcus which is situate on a level with the pore, where it meets the sutural sulci; on the metazonite, its course is directed diagonally upwards. The sutural sulcus is obsolete dorsally, faintly impressed laterally, less marked than the sulcus of the prozonite.

Posterior margin of last segment angularly produced, the apex leaving uncovered the upper angles of the valves. The latter are moderately prominent, slightly compressed and without any trace of marginal sulcus. Anal sternite triangular; its base is broad, about equal to twice the length of the sternite. Sterna of other segments transversely sulcate, the sulci thin and numerous. Stigmata small.

Legs short; from the fourth pair backwards, all the joints except the last are provided with but one ventral bristle.

Male:—Tarsi padded and coxæ of third, fourth and fifth pair produced as in *D. lanceolatus*; yet pads and processes are rather less developed. Femora of second pair flattened interally, gibbous posteriorly. Penis small, conical.

Copulatory appendages (Pl. xvii., figs. 53-55):—Tracheal stalk of anterior gonopods *(ts.)* slender, curved outwardly. Proximal part of the ventral plate in shape of a semicircle, bearing a digitiform process equal in length to the proximal part. Distal expansion of coxa wide and short, not exceeding the length of the ventral plate; the proximal angles produced into an endoskeletic process *(esk.)* about as long as half of the tracheal stalk. Tibia *(T.)* in a line with the femur *(Fem.)*, comparatively long, tapering, tipped with an equilateral triangular piece not quite one third of the length of the tibia, and projecting with its full length beyond the apex of the coxal expansion.

Posterior pair (Pl. xvii., fig. 55) of gonopods of the known form. The distal joint ends in two flagelliform, gradually tapering branches, of which the inner is less than half the length of the outer. Tracheal stalk long, slender, curved distally.

Female unknown.

New Guinea.

DINEMATOCRICUS LANCEOLATUS, *sp. nov.*

(Plate xvii., figs. 58, 59; Plate xviii., figs. 60-64.)

(a) ♂ mat.: length 71 m m; diameter 7 m m; 52 segments; one segment apodous; 95 pair of legs.

(b) ♂ mat.: length 73 m m; diameter 7.50 m m; 51 segments; one segment apodous; 93 pair of legs.

(c) ♂ mat.: length 85 m m; diameter 8.50 m m; 51 segments; one segment apodous; 93 pair of legs.

Chestnut to brown, with black limbs. Head generally darker than the body, brown or blackish-brown, often showing a median band and some spots of the paler ground colour. Body cylindrical; posterior end gradually compressed. Integuments moderately shining.

Head smooth, with a very weak median sulcus. Four labral setiferous dimples. Ocelli small, congregated on a subcircular field, numbering about forty-four to forty-seven, arranged in six or seven series (8+9+8+8+6+5—7+8+8+8+7+6+3).

Distance between the eyes equal to about twice the diameter of one of them. Antennal fossæ shallow. Distance between the antennal sockets equal to the length of the three proximal joints. Antennæ short, not reaching (♂) the posterior margin of the first tergite. The three basal joints almost bare, the following gradually more pilose. Four sensory cones. Micrometrical measurements of joints: 1st joint 0.640 m/m ; 2nd, 0.800 m/m ; 3rd, 0.704 m/m ; 4th, 0.672 m/m ; 5th, 0.640 m/m; 6th, 0.512 m/m ; 7th and 8th, 0.128 m/m : total length, 4.096. Diameter of 2nd joint 0.640 m/m ; of 6th, 0.672 m/m.

The gnathochilarium, and particularly the chitinized cap which stands in front of the laminæ linguales, are identical with the sketch given by Vom Rath[35] of *Spirobolus phranus*. The middle plate of the cap is anchor-shaped ; the mentum is composed of a single plate ; the outer angles of the hypostoma are somewhat more quadrate than in Vom Rath's figure.

First tergite smooth ; its evenly rounded sides do not reach the level of the ventral surface of the body ; the marginal sulcus is short.

Scobinas present from about the tenth to about the thirty-ninth segment. The dimple (Pl. xvii., fig. 59) is very short and wide open anteriorly, being cut in the anterior margin of the segment ; the posterior field is more or less conical with rounded end ; it is covered with dense and minute transverse striæ. On the twenty-fifth zonite the distance between the dimples is about equal to twice the breadth of one of the striate fields. Posterior margin of segments shallowly excised in correspondance with the scobinas of the following segment.

The anterior concealed part of the prozonites is smooth ; the posterior part is adorned dorsally with a microscopical network of minute, irregular striæ, which die out, although not entirely, on the metazonite. Under the microscope, the latter appears spread with scarcely distinct punctures. No tranverse suture is seen between pro- and metazonite. On the sides (Pl. xviii., fig. 60), the prozonite show distinct striæ, two or three of which reach above the pore ; the upper striæ are more or less curved and oblique; lower down they are straighter and encroach gradually more on the metazonite. Pores start with the sixth somite; they open in the prozonite, and they are surrounded upwards and backwards by a special, angularly curved sulcus, the perpendicular posterior branch of which is the only trace of transverse suture to be witnessed.

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[35] Vom Rath—*Loc. cit.*, fig. 33.

Last segment with posterior margin angularly produced; the process does not cover the upper angles of the anal valves. The latter are largely prominent, rather flattened; they are compressed near the margins, which, however, remain rounded and show no trace of marginal sulcus. Anal sternite triangular. Sternites of the other segments transversely striate. Stigmata small.

Legs very short, with but one or two distal bristles on the ventral surface of each joint, except the last.

Male:—Tarsi padded (Pl. xvii., fig. 58); the pads grow larger up to the seventh pair of legs, then become gradually smaller backwards; they disappear after the thirty-sixth zonite. On the five anterior pairs of legs, the ventral surface of joints, three to five, is warted, the warts being larger on the first two pairs than on the following. The second joint of the second pair is hollowed inwardly. The penis is a small membranaceous cone, not even as long as the coxæ of the preceding legs. Coxæ of the third (fig. 58) and fourth pair produced, the process growing smaller on the following pair.

Copulatory appendages:—Anterior gonopods (Pl. xviii., figs 61, 62):—basal piece of the ventral plate *(V.)* twice as wide as high, rounded laterally; its anterior margin is strongly sinuate and, from the middle, starts an elongate process, in shape of a spear-head, about equal in length to the basal part. Tracheal stalk *(ts.)* long and slender. The coxæ are not in contact on the middle line; they are simply connected together through the rounded posterior basal plate *(r.2.)*; their distal expansion is triangular, narrow, and reaches at least the summit of the ventral plate; proximally they end in an oblique endoskeletic process *(esk.)* half as long as the tracheal stalk. Femur fused with the coxa. Tibia in a line with the femur, rather short slightly tapering distally, tipped with an isosceles triangular piece equal to four-fifths of the tibia, reaching somewhat beyond the coxal expansion.

Posterior gonopods (Pl. xviii., fig. 63) as in *Rhinocricus*, two-jointed. The distal joint is split into two flagelliform, gradually tapering branches, of which the inner is about half the length of the outer. Tracheal stalk long and slender, curved distally.

Female unknown.

Three specimens from New Ireland.

DINEMATOCRICUS HOLOSERICEUS, *sp. nov.*

(Plate xviii., figs. 65-69.)

♂ mat.: length 64 m/m; diameter 8 m/m (posteror third), or 7.50 m/m (anterior third); 52 segments; one segment apodous; 95 pair of legs.

Dark chestnut brown; metazonites somewhat more reddish; head and legs brighter. Body stout, stouter backwards.

Head smooth, shining. Four labral dimples, of which the two median stand close together, while the two outer stand apart, outside the labral notch. Median sulcus weak, uninterrupted, although faint between the antennæ. Eyes rounded; the space between them nearly four times the diameter of one of them. Ocelli flattened, moderately distinct, arranged in seven series, to 6+7+7+7+5+4+2 = 38. Antennal sockets shallow; the distance between them nearly equal to the length of the five proximal joints. Antennæ short, reaching the posterior margin of the first segment. Joint one bare; joints two and three with but few distal bristles; joint four with few setæ on the surface besides the distal crown; on the remaining joints the setæ are more and more numerous; four sensory cones. Micrometrical measurements of joints: 1st joint 0.544 m/m; 2nd, 0.608 m/m; 3rd, 0.576 m/m; 4th, 0.512 m/m; 5th, 0.448 m/m; 6th, 0.416 m/m; 7th and 8th, 0.080 m/m; total length 3.184 m/m. Diameter of 2nd joint 0.480 m/m; of 6th, 0.384 m/m.

First tergite falling short of the ventral surface of the second, with indistinct striæ and a faint transverse, dorsal impression. Anterior margin slightly emarginate on a level with the eyes. Sides rounded, though showing traces of posterior angles; the marginal sulcus short. Ventral surface of the second segment flattened, not particularly swollen laterally.

Scobinas from the eighth to about the twenty-first zonite, nearly obsolete on the twenty-second. Dimples (Pl. xviii., fig. 65) divided by a space almost equal to five times the diameter of one of them. Dimples in the shape of a segment of a circle, open frontwards; the bottom gradually rises up to the level of the zonite. Posterior field rather long, narrowed and rounded at the end; striæ thin and numerous.

Concealed part of the prozonite smooth; integuments of the rest of the zonites entirely covered with tiny striæ, extremely dense on the posterior part of the prozonite, less so on the metazonites where the striæ are somewhat coarser; therefrom the integuments gain a silky lustre. On the exposed part of the prozonite, oblique striæ are seen which are much larger and deeper in the anterior part of the body than in the posterior. On the sixth segment, for instance, one of the sulci, starting above the pore, assumes a transverse direction, crossing entirely the dorsal region in front of, and close to, the sutural sulcus; below the pores are five truncate sulci, the posterior ends of which break off in the suture; lower down the sulci, when reaching the suture, assume a longitudinal course and cross the metazonite entirely; the latter striæ are confined to the ventral portion of the segments. The transverse pre-sutural sulcus is interrupted dorsally on segments two, three, four, and gradually shortened on segments eight and backwards, no trace of it being found after the sixteenth; also, the other sulci grow shorter and weaker backwards. Sutural sulcus entire, more distinct in the anterior half of the body than in the posterior half; it is slightly notched behind the pores. Pores begin on the sixth segment; they are located high on the sides, and open in the prozonite, in the centre of a small circular spot which is smooth and shining.

Last segment with its posterior margin scarcely produced, the angle being almost entirely rounded off, and just covering the upper angles of the valves. The latter are considerably reduced, nearly smooth, globular, each with a faint pre-marginal impression. Anal sternite triangular, its length about one-fourth the breadth at the base, its apex blunt. Sterna of other segments sulcate, the sulci few in number (about eight). Stigmata small.

Legs very short, about one-third of the diameter of the body, with but one bristle below on the proximal five joints.

Male:—Coxæ of legs three, four and five bearing a long, thick sub-quadrangular process with rounded distal margin (Pl. xviii., fig. 66). Tarsi not padded.

Copulatory appendages:—Anteror gonopods (Pl. xviii., figs. 67, 68):—basal part of the ventral plate *(V.)* semicircular, tipped with a stout process somewhat broader than long, not even half the length of the basal part, almost entirely rounded. Coxal expansion wide and short, with apex cut at a right angle, and reaching exactly the end of the ventral plate; proximal endoskeletic process *(esk.)* moderately produced, not reaching over one-third of the tracheal stalk. Tibia in a line with and as long as the femur, gradually narrowed distally, tipped with an equilateral triangular piece, with rounded angles, which reaches with its full length over the summit of the coxa. Posterior basal plate *(r.2.)* angular. Tracheal stalk *(ts.)* long, slender, arched.

Posterior gonopods (Pl. xviii., fig. 69) two-jointed; proximal joint as long as the undivided part of the distal joint. Inner branch of the latter not even half the length of the outer, grooved as in *D. carinatus*, the seminal duct seemingly ending in the fork between the branches.

Female unknown.

One male specimen from Fiji.

DINEMATOCRICUS CARINATUS, Karsch, 1881.

(Plate xviii., figs. 70-74).

Spirobolus (Rhinocricus) carinatus, Karsch, 1881, Zeitsch. Naturwiss., liv., p. 73.

Karsch's description runs as follows:—

"Scobina den grössten Theil der Ringe characterisirend, die "Deckenringe am Hinterrande niemals ausgerandet. Endring "die Analklappen nicht überragend. Clypeus schwach "eingeschnitten. ♀, caesio-fuscus, pedibus antennisque flavis, "collo flavo-limbato, anulis postice flavo-marginatis; facie "subglabra, sulco subpartita, clypeo foveolis utrinque 2; "anulis vix segmentatis, parte basali glabra, in anulis 9°-23° "scobina, parte opaca postice acute producta, instructa, parte "media subglabra, subtus et lateribus paullo quidem supra "poros in tumulo quodam simulate partis posticae sitos.

"longitudinaliter sulcata, p. postica carinis longitudinalibus "sat altis ornata; collo lateribus margines annli secundi "ventrales fere attingentibus, sensim angustatis, rotundatis, "sulco marginali tenui; annlo ultimo submucronato, angulo "postico late rotundato, valvulis analibus convexis, marginibus "paullo compressis; antennis collum haud superantibus; "annlis 36. Viti Levu."

The specimens examined agree fairly with Karsch's description; yet doubt remains as to some particulars, such as, how far down do the sides of the first segment reach; how are the dorsal carinæ shaped; how numerous are they, and what the copulatory appendages look like? It has, therefore, been deemed advisable to issue a new description.

♂ mat.: length 32 m/m; diameter 3.70 m/m; 34 segments; one segment apodous; 59 pair of legs (Fiji).

♀ mat.: length about 50 m/m; diameter 5.50 m/m; 35 segments; one segment apodous; 63 pair of legs (Fiji).

The great discrepancy between the measurements of both specimens is accounted for by the fact that the male is a small contracted animal and the female a large extended specimen.

Male:—Black, anterior margin and sides of the first tergite dark brown-red; valves dull brown-yellow; legs, antennæ and labrum ochre-yellow.

Head smooth, shining. Four labral, setiferous dimples. Median sulcus scarcely distinct backwards and even on the upper lip, obsolete mesially. Space between the eyes about twice the diameter of one of them. Eyes rounded, composed of moderately distinct ocelli, arranged in seven series to 7+8+8+7+6+4+2 = 42. Antennal sockets very shallow; distance between them about equal to four proximal joints. Antennæ short, reaching the posterior margin of the first tergite, compressed as usual, slightly thickened distally. The three proximal joints almost bare; fourth joint with but few distal bristles; fifth and sixth gradually more pilose. Four sensory cones. Micrometrical measurements of joints:—1st joint 0.384 m/m; 2nd, 0.512 m/m; 3rd, 0.416 m/m; 4th 0.352 m/m; 5th, 0.352 m/m; 6th, 0.448 m/m; 7th and 8th, 0.096 m/m; total length 2.560 m/m. Diameter of 2nd joint 0.336 m/m; of 6th, 0.384. Mandibular stem (pleuræ) with the inferior angle somewhat pointed.

Scobinas from the eighth segment to about the twenty-fifth, located so close to the anterior margin of the zonite, that they might be mistaken for sinuations of the margin. Dimple (Pl. xviii., fig. 70) open anteriorly, very wide; the posterior field conic rounded, with comparatively few striæ (about ten). The space between the dimples not larger than the diameter of one of them.

First segment with scarcely distinct leathery surface, falling short of the ventral surface of the second segment; sides rounded; marginal sulcus very shallow; a secondary very shallow, incomplete sulcus is seen above the marginal sulcus (may be accidental, see female). Ventral surface of second segment neither concave nor swollen laterally, but crossed by well marked longitudinal sulci, four of which reach above the level of the angle of the preceding tergite.

Anterior concealed part of the prozonite of the following segments almost smooth, or at least without concentric striæ. Posterior part of prozonite striate; the striæ straight dorsally, growing more oblique laterally, and arched on the level of the pores; they again become straight below the pores, encroaching on the metazonite and reaching its posterior margin. The dorsal part of the metazonite (Pl. xviii., fig. 71) is slightly raised, *i.e.*, not on a level with the prozonite. It is crossed longitudinally by some fifteen (on the eighteenth segment), wide and deep grooves, more deeply impressed and closer together on the middle of the back than above the pores, the outer grooves being similar to the sulci below the pores. The grooves are not well outlined, their margins die away in the surface of the metazonite which is convex between the grooves. Sutural sulcus obsolete dorsally, scarcely marked on a level with the pore and below it; it is notched behind the pore, partly surrounding a feebly raised circular area in the middle of which the small pore is cut open. The latter is located rather high in the sides. It begins with the sixth segment. The second and third segment show no dorsal grooves; these are rare and weak on the fourth segment, but rapidly become more numerous and deeper backwards.

Last segment rather long; its posterior margin is angular and just covers the upper angles of the valves. Valves prominent, somewhat globular at the base, compressed near the margins, which are not thickened. Anal sternite triangular with rounded apex; its length is about half of its breadth. Sterna of other segments transversely sulcate, the sulci are comparatively few. Stigmata small.

Legs rather long (3.20 m/m), though not quite as long as the diameter of the body, slender, with but one bristle below on the two proximal joints, two on the third, three on the fourth, five on the fifth, and ten in two rows on the last (twenty-sixth pair of legs).

Male:—Tarsi not padded. Ventral surface of second joint of legs feebly excavated. Coxæ of the third, fourth, and fifth pair produced; the ventral surface of the two following joints nodular.

Copulatory appendages:—Anterior gonopods (Pl. xviii,, figs. 72, 73); basal part of the ventral plate *(V.)* triangular, with straight lateral margins; its length not quite half it breadth at the base; upper angle produced into a spear-head-shaped process about as long as the basal part. Coxal expansion angular, acute distally, as long as the ventral plate or even perhaps a trifle longer; the coxa is produced proximally into a short endoskeletic process *(esk.)* about as long as half the tracheal stalk. Tibia in a line with the femur, rather long parallelsided and narrowed distally, tipped with a small subtriangular plate, with rounded apex, which reaches beyond the summit of the ventral plate. Posterior basal plate *(v. 2.)* subtriangular, emarginate laterally; apex blunt. Tracheal stalks *(ts.)* long, slender, crooked as usual.

Posterior gonopods (Pl. xviii., fig. 74) two jointed. Unfortunately the main outer branch is broken off on both gonopods. The inner branch is ribbon-shaped; its lamellar, neatly undulate margins are somewhat curled up towards the outer branch, thus forming a longitudinal groove. The seminal duct seems to open at the bottom of the fork of the distal joint, in between the two branches. Tracheal stalk long, slender, curved distally.

Female:—Ground colour grey-brown (evidently altered); labrum, antennæ, the margins of all segments, the apex of the last and the valves dull ochraceous. A broad band of the same ochraceous colour adorns the dorsal part of the body, from the second to about the fifteenth segment; besides, the metazonites are marked between the pores with longitudinal black strokes, more dull on the posterior darker half of the body than on the lighter anterior half; these strokes are in connection with the sulci of the metazonites. Legs bright ochre-yellow.

Head strongly shining, as if varnished. Median sulcus weak scarcely interrupted between the antennæ. Ocelli disposed in seven rows (6+7+7+7+6+5+2 = 40 or 7+7+7+7+6+4+3 = 41). Micrometrical measurements of antennal joints:—1st joint 0.608 m/m; 2nd, 0.736 m/m; 3rd, 0.608 m/m; 4th, 0.544 m/m; 5th, 0.544 m/m; 6th, 0.592 m/m; 7th and 8th, 0.080 m/m; total length 3.712 m/m. Diameter of 2nd joint, 0.464 m/m; of 6th, 0.480 m/m.

Sides of the first segment without secondary sulcus above the marginal sulcus.

Grooves on the eighteenth segment thirteen in number (instead of fifteen).

Fiji.

? SPIROBOLUS, *sp.*

♀ mat.: length 62 m/m; diameter 5 m/m; 51 segments; one segment apodous; 95 pair of legs.

The absence of males prevents us from ascertaining the systematic position of this species. The shape of the first segment is similar to that of *Spirostrophus digitulus.* The prozonite shows transverse striæ instead of punctures. Scobinas absent. The tiny pores are located on the limit between pro- and the metazonite; but as the suture is indistinct and the metazonite extremely short, it seems that the pores open in the metazonite. The pores start from the sixth segment. The valves are prominent, globular, without any trace of premarginal depression.

The most interesting feature is the existence of 4 + 4 setiferous dimples on the upper lip, a character which agrees with none of the genera here recorded.

Three female specimens (of which only one adult) from Newcastle, New South Wales, and Queensland.

TABLE I.

AUSTRALIAN CONTINENT.

1 (2)—3+3 labral pores.... . *Spirobolus lugubris*, L. Koch.

2 (1)—2+2 labral pores 3

3 (4)—Scobinas wanting . *Spirobolus cœruleolimbatus*, Daday.

4 (3)—Scobinas present 5

5 (6)—Very large species, diameter of body 20 m/m, 61 segments.............. *Rhinocricus fasciculatus*, Voges.

6 (5)—Medium sized species, diameter of body not over 8 m/m, 44/56 segments.... 7

7 (8)—Anal valves showing a deep pre-marginal sulcus. Transverse sutural sulcus of segments deep. Metazonites smooth ... ... *Rhinocricus brevipes*, Karsch.

8 (7)—Anal valves more or less compressed, but without pre-marginal sulcus. Transverse sutural sulcus weak or obsolete. ... 9

9 (12)—Exposed part of prozonite and metazonite smooth .. 10

10 (11)—Diameter of body 6 m/m. Segments 43/44 in number. Scobinas in segments 12 to 30. Somerset, Cape York Peninsula, Queensland ....
Rhinocricus opulentus, Silvestri.

11 (10)—Diameter of body 7 m/m. Segments 53. Scobinas in segments 9 to penultimate. Gayndah.. ...
D. (*Cladiscocricus*) *falcatus*, Silvestri.

12 (9)—Exposed part of prozonite and metazonite in some way sculptured (punctured, striate, &c.). ... 13

13 (14)—Exposed part of prozonite and metazonite entirely beset with tiny striæ ("tota rugis minimis obsessa"). Segments 44 in number
Rhinocricus senae, Silvestri.

14 (13)—Exposed part of zonites at least partly punctured, the punctures intermingled with striæ or not...... 15

15 (18)—Legs of male not padded.... 16

16 (17)—Distance between the scobinas equal to eight times the breadth of one of them . . . .
D. (Cladiscocricus) falcatus scobinula, sp. nov.

17 (16)—Distance between the scobinas hardly equal to the breadth of one of them.. . . ..
D. (Cladiscocricus) consimilis, sp. nov.

18 (15)—Legs of male padded[36]... .. . .
Rhinocricus crepidatus (L. Koch), Karsch.

TABLE II.

NEW GUINEA.

1 (8)—Scobinas wanting 2

2 (5)—Segments dorsally smooth. 3

3 (4)—Sides smooth ("segmenta in latere et supra glabris, politis"). Large species 107 to 110 m/m. . . ..
Spirobolus fenicheli, Daday.

4 (3)—Sides grooved ("parte postica late et plane longitudinaliter subcanaliculata, dorso ceterum glabro")........
Spirobolus adipatus, Karsch.

5 (2)—Segments dorsally sulcate or striate.. 6

6 (7)—Sulci deep, wide and rare ("parte detecta sulcis sat latis et profundis, raris et inaequalibus, lateribus striatis"). Very large species, 170 to 180 m m. First tergite falling short of the second laterad... . . . .
Rhinocricus gravis, Silvestri.

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[36] Karsch—(Zeitsch. Naturwiss., liv., 1881, p. 74) describing *Spirobolus (Rhinocricus) crepidatus*, adds in brackets "*Pelmatoiulus crepidatus*, L. Koch i litt.". This implies that the legs of male *crepidatus* bear tarsal pads, as Saussure's division, *Pelmatoiulus*, is precisely based on this sole character. Also it has been admitted that in *consimilis*, the male of which is unknown, the pads are missing as in *scobinula*, owing to the close relationship of both forms.

7 (6)—Sulci narrow and dense ("dorso striis subinaequalibus minutis, sat crassa et dense rugosis"). First tergite reaching as low down as the second ... ... *Spirobolus cœlatus*, Karsch.

8 (1)—Scobinas present 9

9 (10)—Scobinas on segments 10 to 21. Segments said to be "lateribus inferne tantum striatis"... *Rhinocricus dives*, Silvestri.

10 (9)—Scobinas more numerous, to be found after the 21st segment... 11

11 (16)—Medium sized species, not exceeding 70 m/m in length... 12

12 (13)—Scobinas up to about the 40th segment, in shape of an arched line......... .....*Rhinocricus dimissus*, Silvertri.

13 (12)—Scobinas not to be found behind the 30th segment...14

14 (15)—Diameter of the body 6.50 m/m. Scobinas from the 8th to the 30th segment.................. .... *Rhinocricus montivagus*, Silvestri.

15 (14)—Diameter of the body 5 m/m. Scobinas from the 14th to the 30th segment...... .... *Dinematocricus disjunctus*, sp. nov.

16 (11)—Large sized species, over 100 m/m in length......17

17 (18)—Cephalic median sulcus obsolete. Ventral plate of anterior gonopods said to be "apice rectangulari longiore." Scobinas in segments 8 to 31. Coxæ of 3rd and 4th pairs with "processu laminari, trianguliformi." ....*Dinematocricus loria*, Silvestri.

18 (17)—Median sulcus always present, at least behind the antennæ... 19

19 (20-21—Process of ventral plate of anterior gonopods said to be "subrhomboidali." Scobinas in segments 9 to 41.....................*Dinematocricus albertisi*, Silvestri.

20 (19-21)—Process of ventral plate with straight lateral margins and apex truncate. Scobinas in segments 8 to 30/33........................*Dinematocricus analis*, sp. nov.

21 (19-20)—Process of ventral plate with sinuate lateral margins and narrowed, more or less blunt apex. Scobinas in segments 8/9 to 36/37........................22

22 (23)—Coxal expansion of anterior gonopods as long or a trifle longer than the process of ventral plate, acute. Segments without punctures along the suture. Sternites of the body deeply sulcate..............................
Dinematocricus furcatus, Silvestri.

23 (22)—Coxal expansion of anterior gonopods scarcely reaching beyond the middle of the process of ventral plate, blunt. Segments punctured along the suture. Sternites of the body weakly sulcate........................
Dinematocricus faucium, sp. nov.

TABLE III.

BISMARCK ARCHIPELAGO to SOLOMON ISLANDS.

1 (2)—Scobinas wanting. First tergite reaching as low down as the 2nd...............*Spirobolus caelatus*, Karsch.

2 (1)—Scobinas present.—First tergite falling short of the 2nd. laterad... 3

3 (4)—Posterior margin of last segment produced into a short spiniform, downward curved process, overreaching the valves..............*Spirobolus rogesi*, Karsch.

4 (3)—Posterior margin of last segment more or less triangular, not reaching beyond the valves.................5

5 (8)—Posterior margin of same segment excised in correspondence with scobinas of the following segment... 6

6 (7)—Legs black. Anal valves prominent...........
Dinematocricus lanceolatus, sp. nov.

7 (6)—Legs reddish-yellow. Anal valves "scarcely at all produced beyond the level of the tergite." ......
Rhinocricus biincisus, Pocock.

8 (5)—None of the segments with posterior margin excised ... 9

9 (10)—Back of the body ornamented with a pair of light coloured bands (red or yellow). Median process of ventral plate of anterior gonopods longer than the half-moon-shaped basal part ...
Rhinocricus cristovalensis, Pocock.

10 (9)—Back without longitudinal bands. Median process of ventral plate shorter than the basal part
Rhinocricus gazellensis, Pocock.

Table IV.

FIJI.

1 (2)—Anal valves granular
Spirobolus colubrinus L. Koch.

2 (1)—Anal valves smooth ... 3

3 (4)—Posterior margin of last segment ending in a well defined process, overreaching the level of the anal valves ... *Spirobolus pictus*, L. Koch.

4 (3)—Posterior margin of last segment more or less angular or rounded, not overreaching the anal valves ...5

5 (6)—4+4 labial dimples... *Spirobolus detornatus*, Karsch.

6 (5)—2+2 labial dimples... 7

7 (12)—Metazonites provided with longitudinal ridges or carinæ; when the latter are feebly developed, they are dense and encroach on the prozonite. 37 to 39 segments... 8

8 (11)—Ridges to be found on the prozonites as well as on the metazonites ... 9

9 (10)—Legs and antennæ pale yellow
Spirobolus signifer, Karsch.

10 (9)—Legs and antennæ at least partly black or blackish
Spirobolus costatus, L. Koch.

11 (8)—Rounded carinæ on the metazonites only
Dinematocricus carinatus, Karsch.

12 (7)—Metazonites bearing sulci or striæ, but without ridges or carinæ 13

13 (14)—Scobinas wanting. Concealed anterior part of prozonite with concentric striæ, exposed posterior part punctured . . *Spirobolus decoratus*, Karsch.

14 (13)—Scobinas present.. .. . 15

15 (16)—Posterior margin of some segments excised in correspondence with the scobinas of the following segments . . ..*Rhinocricus undulatus*, Karsch.

16 (15)—None of the segments with posterior margin excised 17

17 (18)—Metazonites with distinct punctures . *Rhinocricus excavatus*, Silvestri.

18 (17)—Metazonites smooth or with striæ.. 19

19 (20)—Metazonite and prozonite densely beset with striæ, showing a silky lustre. Distal joint of posterior gonopods ending in two flagelliform, gradually tapering branches, the inner of which scarcely reaches the half of the length of the outer .. . . . . *Dinematocricus holosericeus*, sp. nov.

20 (19)—Metazonite smooth, without lustre. Distal joint of posterior gonopods ending in two flagelliform branches of equal length ; or else the outer branch grows wider distad, its apex being truncate and spined.. 21

21 (22)—Sutural sulcus obsolete. Both branches of posterior gonopods are flagelliform, of subequal length. Large size, 115 m/m ....*Dinematocricus micropygus*, Silvestri.

22 (21)—Sutural sulcus entire. Outer branch of posterior gonopods widened distad. Medium size, 60 m/m *Rhinocricus bicornis*, Silvestri.

APPENDIX.

Genus AMASTIGOGONUS, *gen. nov.*

We are mainly indebted to Attems for the knowledge we possess of the Iuloid group of the Cambalidæ.[37]

This group is already represented on the Australian continent by the genus *Dimerogonus* of which the most striking feature is the presence, in the anterior gonopods, of a flagellum similar to that often met with in European Iuloids.

Attems (1903) gave the following diagnosis of his genus *Dimerogonus* :—

"Ocellen zahlreich, mehreihig. Scheitelborsten fehlen. "Oberlippenrand 3 zähnig. Mandibel mit 9 Kammblättern. "Gnathochilarium wie bei *Glyphiulus* and *Agastrophus*: die "Stipites und die Zungenblätter sind durch das Mentum und "das davon geschiedene Promentum vollkommen getrennt. "Promentum ohne Längstheilung. Halsschild glatt; Rumpf"segmente ohne erhabene Kiele; die Metazoniten sind nur "ventral fein längsgefurcht (etwa wie bei *Blaniulus*), sonst "glatt. Saftlöcher weit hinter der Quernaht gelegen, beginnen "auf dem 6. Segment. Analsegment ohne vorragendes "Schwänzchen. 1. Beinpaar des ♂ 6gliedrig. Einige "Basalglieder stark verbreitet, das Endglied klauenlos. Vor"dere Copulationsfüsse, 2gliedrig; das Basalglied (= Hüfte) "gross, plattig, mit einem Flagellum; das 2. glied (= Schenkel) "kleiner, mehr lateral inserirt. Hintere Copulationsfüsse "mehr oder weniger deutlich 2gliedrig. Heimath: Australien, "Neuseeland."

From the description of the type specimen, *D. orophilus*, from Sydney, we learn besides that the anterior gonopods are provided with a distinct ventral plate.

The specimens preserved in the Australian Museum, and originating from Tasmania, decidedly show a relationship with Attems' genus, yet cannot be placed herein, as the ventral plate of the anterior gonopods is fused with the basal joint of the gonopods; and there is, indeed, a kind of flagellum, but it is very different in shape and position from what is shown in Attems' figures as well as in those of congeneric species described by Prof. Silvertri[38] as it is not attached to the base of the posterior inner edge of the proximal joint, but to the inner edge of the distal joint. Moreover the posterior gonopods are simple; they also bear a lateral process, but the latter is fused with the main stem of the organ.

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[37] Attems—Zool. Jahrb., xiii., Heft 2, 1890; *Ibid*, xviii., Heft 1, 1903.

A new genus has consequently to be created, for which the name *Amastigogonus* is proposed, with the following diagnosis:—

Primary Characters:—Anterior gonopods two-jointed. Ventral plate fused with the proximal joint of the gonopods, therefore not distinct. The distal joint bears a ribbon-shaped pseudoflagellum. Posterior gonopods single-jointed. Gnathochilarium as in *Dimerogonus*.

Secondary Characters:—Eyes present, composed of numerous ocelli. Labral notch filled with five teeth; setiferous dimples six to eight. Mandible with five (or six) pectinate lamellæ; male mandibular stem expanded. Segments without keels or tubercules; last segment without caudal process. Pores opening in the metazonite. First, second and third pair of legs of male as in *Dimerogonus*.

Type:—*A. tasmanianus*. Tasmania.

From the related genera *Agastrophus*, Attems, and *Hypocambala*, Silvestri, *Amastigogonus* is readily distinguished by the presence of the pseudoflagellum of the anterior gonopods.

AMASTIGOGONUS TASMANIANUS, *sp. nov.*

(Figures 32-37).

(a) ♂ mat.: length 53 m/m; diameter 2.90 m/m; 63 segments; two segments apodous; 115 pair of legs.

(b) ♂ mat.: length ?; diameter 3.20 m/m; 62 segments; two segments apodous; 113 pair of legs.

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[38] Silvestri—Fauna Hawaiiensis, iii., 1904.

(c) ♂ mat.: length 44 m/m; diameter 2.80 m/m; 56 segments; three segments apodous; 99 pair of legs.

(d) ♀ mat.: length 45 m/m; diameter 3 m/m; 61 segments; three segments apodous; 111 pair of legs.

Black, legs brown. Body cylindrical, moderately shining.

Head smooth. Labral notch wide, rounded, provided with five teeth; labral setiferous dimples 3 + 3 to 4 + 4. Median sulcus short, to be seen only on the back of the head, abruptly broken off on a level with the inner angle of the eyes. Eyes divided by a space about equal to the largest diameter of one of them; ocelli flattened, arranged in four or five series (9+8+8+8 = 33 to 10+9+9+8+7 = 43). Distance between the antennæ equal to about the length of the three proximal joints. Antennæ reaching the posterior margin of the third segment, scarcely clavate, moderately pilose, tipped with four sensory cones. Micrometrical measurements of joints:—1st joint 0.172 m/m; 2nd, 0.516 m/m; 3rd, 0.516 m/m; 4th, 0.430 m/m; 5th, 0.430 m/m; 6th, 0.473 m/m; 7th and 8th, 0.086 m/m; total length, 2.623 m/m. Diameter of 2nd joint 0.301 m/m; of 6th, 0.387 m/m.

First tergite fairly long dorsally. Its sides do not reach as low down as the second segment; in fact they are slightly angular, but, the outer margin being somewhat curled in, they appear rounded when seen in profile. Surface smooth dorsally; the sides bear five or six moderately deep sulci, of which three reach the level of the eyes, the remaining two or three being shortened. The anterior margin is not excised.

Anterior, concealed part of prozonite of other segments showing weak concentric striæ; the latter are marked now and then with minute, strongly shining granules, which become more numerous ventrally. The posterior, exposed part of the prozonite and the metazonite are somewhat uneven, yet without definite sculpture except some tiny longitudinal striæ irregularly disposed, but mainly to be found along the suture. Transverse sutural sulcus well marked all round, usually interrupted on a level with the first or second longitudinal sulcus of the metazonite; the following sulci remain independant, their anterior ends being diagonally directed upwards and gradually dying out in the prozonite. The sulci are more strongly marked on the anterior than on the median or posterior segments; they are also more numerous there than here, and consequently reach nearer to the pore. The pores start from the sixth segment and open in the metazonite; they are located high on the sides and are scarcely nearer to the suture than to the posterior margin of the segment.

Last segment longish, with its posterior margin slightly produced, the angle being very wide, the apex rounded and the margin of the segment scarcely emarginate laterally: it just conceals the upper angles of the valves without overreaching them. The valves are not prominent; they are globular even along their margins, where some tiny, fleecy, pale hairs are to be seen. Anal sternite somewhat swollen, with almost straight posterior margin. Sternites of the remaining segments of the body smooth, not striate. Stigmata very small.

Legs moderately long; second joint with two rows each of three bristles on its ventral surface, and a crown of six bristles around its distal end (three anterior and three posterior).

Male:—The lower edge of the mandibular stem is strongly produced, rounded. Legs of the first pair (fig. 32) showing a free narrow plate at the base of the posterior surface, which has been considered as a ventral plate by Dr. Attems; a pair of basal joints *(1.)*, largely expanded laterally, said to be coxæ,[39] to which the tracheal stalks *(ts.)* are attached; finally a telopodit composed of five condensed joints *(2-6)*, of which the two proximal (joints two and three of the legs) are broader than the three distal joints; the last joint is globular, destitute of claw.

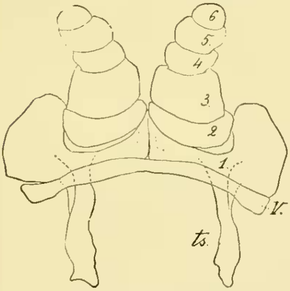

Fig. 32.—*Amastigogonus tasmanianus.* —First pair of legs posterior surface.

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[39] The homology of ventral plate and coxæ is perhaps not quite correct, and will have to be submitted to further examination.

Legs of the second pair scarcely modified. The ventral plate is divided into two plates; the coxæ are elongate as usual; their base is excavated in the middle of the posterior surface, the space being filled by the chitinized openings of the seminal ducts; the telopodit is five-jointed, and the joints are normal.

Legs of the third pair similar to the preceding except that the posterior ventral plate is not divided; the coxal joint shows traces of the division, so that a transverse band is seen on the anterior surface expanding laterally around the base of the true coxal joints, the tracheal stalks being attached to the lateral expansions; and finally the distal end of the coxæ show an additional joint, more or less completely detached, which has to be considered as a trochanter.

From the fourth pair of legs backwards (fig. 33), the trochanter *(tr.)* is present, the second joint of all legs *(prf.)* is split open longitudinally on the distal half of its ventral surface; the cleft is closed by a soft membrane *(m.)* which, when normally evaginated, assumes the shape of a conical process, the apex of which reaches over the middle of the next joint. This membranaceous process becomes fully developed only on the legs of the eighth segment and does not disappear but on the last few pairs.

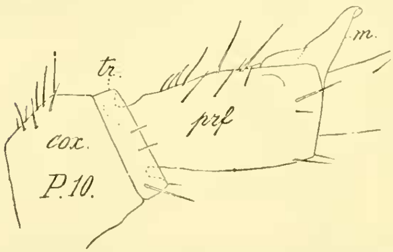

Fig. 33.—*Amastigogonus tasmanianus.*—Three proximal joints of a leg of the 10th pair. *tr.* = trochanter; *m.* = membranaceous process.

Coxæ of the seventh pair swollen, globular.

The seventh segment is broader than the preceding and the following segments; its ventral ends are twisted and protruded. The apices of the gonopods are seen to project out of the copulatory sac.

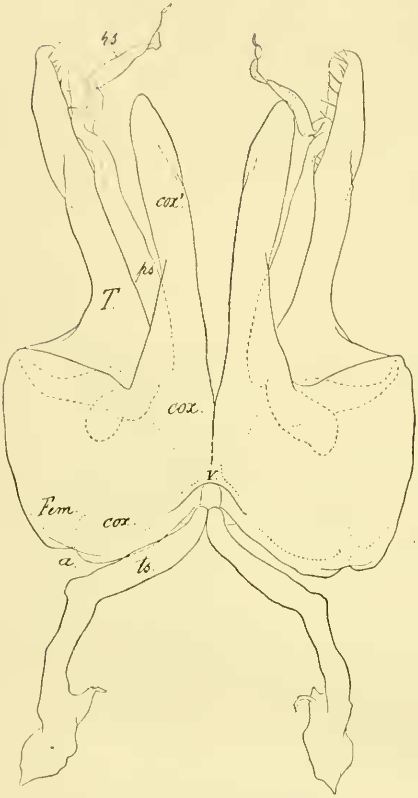

Fig. 34.—*Amastigogonus tasmanianus.*—Anterior gonopods, anterior surface.

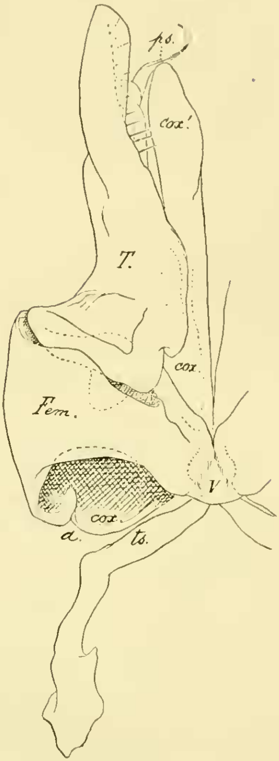

Fig. 35.—*Amastigogonus tasmanianus.*—Anterior gonopods, posterior surface. *a.* = notch between coxa and femur.

Copulatory appendages (figs. 34-37) :—Anterior gonopods two-jointed. The ventral plate *(V.)* is not free ; it is represented by a narrow, longitudinal, median thickening fused with the inner proximal margin of the proximal joints ; the slender, crooked tracheal stalks *(ts.)* converge towards the anterior end of the thickening. Proximal joint cylindrical, short and broad, with its inner anterior angle produced into a long, spatulate process, with rounded apex *(cox')*. Along the anterior proximal margin of the joint a notch *(a.)* is to be seen, which leads us to infer that the proximal joint is the representative of both coxa *(cox.)* and femur *(Fem.)* (and not *only the* *femur*, as suggested by Attems) fused together. The distal joint (*T.*, fig. 36), or tibia, is a flattened body, expanded at its base to articulate with the cylindrical part of the preceding joint (femur), bearing a row of bristles on its inner concave surface; its rounded apex reaches beyond the summit of the coxal process; its inner edge is folded back and is produced into a long, gradually tapering, ribbon-shaped pseudoflagellum (*ps.*)

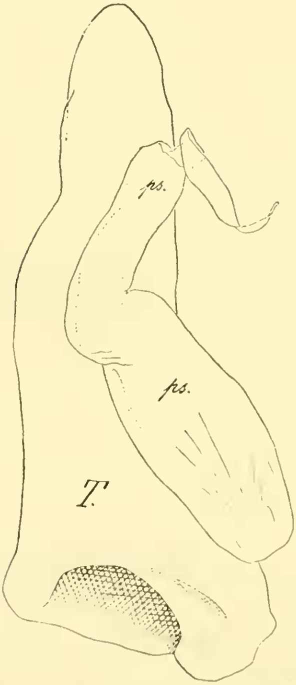

Fig. 36.—*Amastigogonus tasmanianus.* —Distal joint of anterior gonopod, inner view. *ps.* pseudoflagellum.

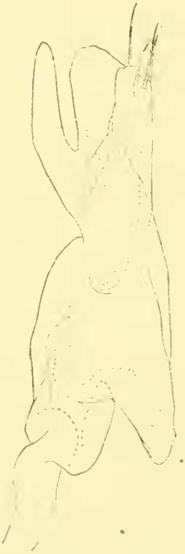

Fig. 37.—*Amastigogonus tasmanianus.*—Posterior gonopod.

The posterior gonopods (fig. 37) are entirely independant of one another. No ventral plate could be traced. The gonopod shows no trace of division, but is contracted in the middle. The distal half is lamellar, longitudinally folded at a right angle and truncate, and bears four or five apical bristles and an inner digitiform process. The proximal half articulates with the long and slender tracheal stalks of usual shape. Neither seminal duct nor bladder could be detected.

Tasmania.